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THE
AERICAN EPHEMERIS

AND
NAUTICAL ALMANAC.

FOR THE YEAR

1 8 6 1 .

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.

BUREAU OF ORDNANCE AND HYDROGRAPHY,
WASHINGTON.
1858.

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ELECTROTYPED AND PRINTED BY METCALF AND COMPANY.

1861

P R E F A C E .

THE preparation of the American Ephemeris and Nautical Almanac was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation, its details, the values of the constants adopted, and the means employed in various parts of the work to secure additional accuracy, or greater convenience, will be found in the Preface and Appendix of the first volume, for the year 1855. The form and arrangement of the Ephemeris, and the plan for prosecuting the work, then devised and adopted by Lieut. Charles Henry Davis, the Superintendent, with the co-operation of Prof. Benjamin Peirce, have been retained, with slight modification, in the succeeding volumes.

The contents of the volume for the year 1861 are the same generally as those of the volume for the year 1860. A change has been made in the Heliocentric Coördinates of the Principal Planets, to facilitate the computation of special perturbations. In this volume, they are referred to the mean equinox and ecliptic of the 2400,000th day of the Julian Period, instead of to the true equinox and equator of date, as heretofore.

A Supplement has been added, containing the latest elements of the Asteroids, and Ephemerides of thirty-three of them for 1859, and the Heliocentric Coördinates of Mars, Jupiter, and Saturn from the 2400,000th day of the Julian Period to the beginning of the year 1861.

The Table of Geographical Positions of the Principal Observatories has been revised and improved by Dr. Gould.

JOSEPH WINLOCK,

Prof. Math. U. S. Navy, Superintendent.

CAMBRIDGE, January, 1859.

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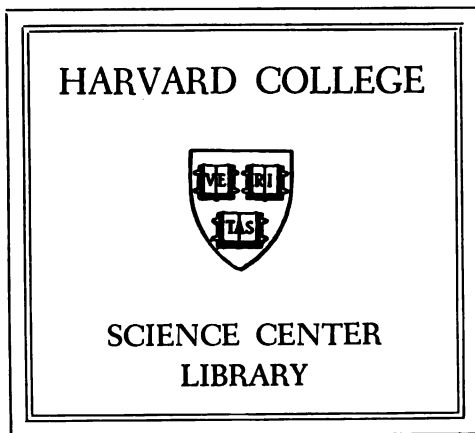
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ASTEROID SUPPLEMENT.

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SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, &c.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁ or ♂	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring signs.	{	1.	♈	Aries.	Autumn signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpio.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer signs.	{	4.	♋	Cancer.	Winter signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

ASPECTS.

♌	Conjunction, or having the same Longitude or Right Ascension.			
☐	Quadrature, or differing 90° in	"	"	"
♌	Opposition, or differing 180° in	"	"	"

ABBREVIATIONS.

♈	Ascending Node.	'	Minutes of Arc.
♏	Descending Node.	"	Seconds of Arc.
N.	North. S. South.	h.	Hours.
E.	East. W. West.	m.	Minutes of Time.
°	Degrees.	s.	Seconds of Time.

ASTRONOMICAL EPHEMERIS

FOR THE USE OF

NAVIGATORS.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Tues.	1	^h 18 ^m 48 ^s 27.62	11.033	S. 22° 59' 26.1"	12.76	16' 18.42"	71.08	^m 3 58.14	1.176
Wed.	2	18 52 52.33	11.019	22 54 6.0	13.91	16 18.41	71.02	4 26.23	1.163
Thur.	3	18 57 16.69	11.004	22 48 18.3	15.05	16 18.39	70.97	4 53.95	1.148
Fri.	4	19 1 40.68	10.988	22 42 3.3	16.18	16 18.37	70.92	5 21.31	1.131
Sat.	5	19 6 4.27	10.971	22 35 21.3	17.30	16 18.35	70.86	5 48.27	1.114
Sun.	6	19 10 27.42	10.952	22 28 12.4	18.42	16 18.31	70.79	6 14.79	1.096
Mon.	7	19 14 50.11	10.932	22 20 36.7	19.52	16 18.27	70.72	6 40.84	1.076
Tues.	8	19 19 12.31	10.911	22 12 34.7	20.62	16 18.23	70.65	7 6.40	1.054
Wed.	9	19 23 33.98	10.889	22 4 6.5	21.70	16 18.19	70.58	7 31.45	1.032
Thur.	10	19 27 55.10	10.866	21 55 12.3	22.78	16 18.15	70.51	7 55.95	1.009
Fri.	11	19 32 15.64	10.841	21 45 52.5	23.84	16 18.10	70.43	8 19.86	0.984
Sat.	12	19 36 35.56	10.815	21 36 7.4	24.88	16 18.04	70.35	8 43.16	0.958
Sun.	13	19 40 54.85	10.788	21 25 57.2	25.92	16 17.98	70.26	9 5.83	0.931
Mon.	14	19 45 13.48	10.760	21 15 22.2	26.95	16 17.92	70.17	9 27.84	0.904
Tues.	15	19 49 31.44	10.731	21 4 22.6	27.96	16 17.85	70.08	9 49.19	0.875
Wed.	16	19 53 48.70	10.701	20 52 59.1	28.96	16 17.78	69.98	10 9.84	0.845
Thur.	17	19 58 5.22	10.671	20 41 11.9	29.94	16 17.70	69.88	10 29.75	0.814
Fri.	18	20 2 21.01	10.640	20 29 1.2	30.91	16 17.62	69.78	10 48.93	0.782
Sat.	19	20 6 36.06	10.609	20 16 27.3	30.87	16 17.54	69.68	11 7.38	0.751
Sun.	20	20 10 50.33	10.577	20 3 30.6	32.81	16 17.45	69.58	11 25.05	0.719
Mon.	21	20 15 3.81	10.544	19 50 11.6	33.74	16 17.35	69.47	11 41.93	0.687
Tues.	22	20 19 16.50	10.510	19 36 30.4	34.65	16 17.25	69.36	11 58.02	0.654
Wed.	23	20 23 28.39	10.477	19 22 27.5	35.55	16 17.15	69.25	12 13.31	0.621
Thur.	24	20 27 39.48	10.444	19 8 3.4	36.43	16 17.04	69.14	12 27.80	0.588
Fri.	25	20 31 49.76	10.410	18 53 18.5	37.29	16 16.92	69.03	12 41.48	0.555
Sat.	26	20 35 59.25	10.377	18 38 12.9	38.15	16 16.79	68.92	12 54.39	0.522
Sun.	27	20 40 7.94	10.343	18 22 46.9	38.99	16 16.66	68.81	13 6.49	0.488
Mon.	28	20 44 15.80	10.309	18 7 1.0	39.81	16 16.53	68.70	13 17.76	0.453
Tues.	29	20 48 22.84	10.276	17 50 55.6	40.61	16 16.40	68.58	13 28.22	0.419
Wed.	30	20 52 29.07	10.242	17 34 31.1	41.40	16 16.25	68.46	13 37.86	0.386
Thur.	31	20 56 34.50	10.208	17 17 47.8	42.18	16 16.09	68.35	13 46.72	0.352
Fri.	32	21 0 39.12	10.175	S. 17 0 46.1	42.94	16 15.93	68.24	13 54.75	0.318

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Tues.	1	18 48 26.88	11.033	S. 22 59 27.0	12.76	3 58.06	1.176	18 44 28.82
Wed.	2	18 52 51.51	11.019	22 54 7.0	13.91	4 26.14	1.163	18 48 25.37
Thur.	3	18 57 15.79	11.004	22 48 19.5	15.05	4 53.86	1.148	18 52 21.93
Fri.	4	19 1 39.70	10.988	22 42 4.7	16.18	5 21.21	1.131	18 56 18.49
Sat.	5	19 6 3.21	10.971	22 35 22.9	17.30	5 48.16	1.114	19 0 15.05
Sun.	6	19 10 26.28	10.952	22 28 14.2	18.42	6 14.68	1.096	19 4 11.60
Mon.	7	19 14 48.89	10.932	22 20 38.8	19.52	6 40.73	1.076	19 8 8.16
Tues.	8	19 19 11.01	10.911	22 12 37.1	20.62	7 6.29	1.054	19 12 4.72
Wed.	9	19 23 32.61	10.889	22 4 9.2	21.70	7 31.33	1.032	19 16 1.28
Thur.	10	19 27 53.66	10.866	21 55 15.3	22.78	7 55.82	1.009	19 19 57.84
Fri.	11	19 32 14.13	10.841	21 45 55.8	23.84	8 19.74	0.984	19 23 54.39
Sat.	12	19 36 33.98	10.815	21 36 11.0	24.88	8 43.03	0.958	19 27 50.95
Sun.	13	19 40 53.21	10.788	21 26 1.1	25.92	9 5.70	0.931	19 31 47.51
Mon.	14	19 45 11.78	10.760	21 15 26.4	26.95	9 27.71	0.904	19 35 44.07
Tues.	15	19 49 29.68	10.731	21 4 27.2	27.96	9 49.05	0.875	19 39 40.63
Wed.	16	19 53 46.88	10.701	20 53 4.0	28.96	10 9.70	0.845	19 43 37.18
Thur.	17	19 58 3.35	10.671	20 41 17.1	29.94	10 29.61	0.814	19 47 33.74
Fri.	18	20 2 19.09	10.640	20 29 6.7	30.91	10 48.79	0.782	19 51 30.30
Sat.	19	20 6 34.09	10.609	20 16 33.1	31.87	11 7.24	0.751	19 55 26.85
Sun.	20	20 10 48.32	10.577	20 3 36.8	32.81	11 24.91	0.719	19 59 23.41
Mon.	21	20 15 1.76	10.544	19 50 18.2	33.74	11 41.79	0.687	20 3 19.97
Tues.	22	20 19 14.41	10.510	19 36 37.4	34.65	11 57.88	0.654	20 7 16.53
Wed.	23	20 23 26.26	10.477	19 22 34.8	35.55	12 13.18	0.621	20 11 13.08
Thur.	24	20 27 37.31	10.443	19 8 11.0	36.43	12 27.67	0.588	20 15 9.64
Fri.	25	20 31 47.56	10.410	18 53 26.4	37.29	12 41.36	0.555	20 19 6.20
Sat.	26	20 35 57.02	10.377	18 38 21.1	38.15	12 54.27	0.522	20 23 2.75
Sun.	27	20 40 5.68	10.343	18 22 55.4	38.99	13 6.37	0.488	20 26 59.31
Mon.	28	20 44 13.52	10.309	18 7 9.8	39.81	13 17.65	0.453	20 30 55.87
Tues.	29	20 48 20.54	10.276	17 51 4.7	40.61	13 28.12	0.419	20 34 52.42
Wed.	30	20 52 26.75	10.242	17 34 40.5	41.40	13 37.77	0.386	20 38 48.98
Thur.	31	20 56 32.16	10.208	17 17 57.5	42.18	13 46.63	0.352	20 42 45.53
Fri.	32	21 0 36.76	10.175	S. 17 0 56.1	42.94	13 54.67	0.318	20 46 42.09

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		True LONGITUDE.		Dist. for 1 hour.	LATITUDE.			
		λ	λ'					
1	1	281° 8' 33.9	8' 17.6	152.89	—0.67	9.9926474	1.5	5 ^h 14 ^m 39.50 ^s
2	2	282 9 43.3	9 26.7	152.89	0.76	.9926524	2.5	5 10 43.56
3	3	283 10 52.9	10 36.1	152.90	0.82	.9926600	3.5	5 6 47.67
4	4	284 12 2.7	11 45.7	152.90	0.84	.9926689	4.5	5 2 51.76
5	5	285 13 12.5	12 55.4	152.91	0.84	.9926819	5.4	4 58 55.84
6	6	286 14 22.5	14 5.2	152.91	0.80	.9926960	6.3	4 54 59.93
7	7	287 15 32.5	15 15.0	152.91	0.73	.9927120	7.1	4 51 4.02
8	8	288 16 42.6	16 24.9	152.91	0.64	.9927299	7.8	4 47 8.11
9	9	289 17 52.5	17 34.6	152.90	0.53	.9927495	8.5	4 43 12.20
10	10	290 19 2.2	18 44.2	152.90	0.41	.9927709	9.2	4 39 16.28
11	11	291 20 11.6	19 53.4	152.89	0.27	.9927939	9.9	4 35 20.37
12	12	292 21 20.5	21 2.1	152.87	0.14	.9928186	10.5	4 31 24.46
13	13	293 22 28.9	22 10.3	152.85	—0.01	.9928450	11.2	4 27 28.55
14	14	294 23 36.8	23 18.0	152.82	+0.10	.9928731	11.9	4 23 32.64
15	15	295 24 44.1	24 25.2	152.79	0.20	.9929027	12.7	4 19 36.72
16	16	296 25 50.6	25 31.5	152.75	0.27	.9929340	13.4	4 15 40.81
17	17	297 26 56.2	26 36.9	152.71	0.31	.9929672	14.2	4 11 44.90
18	18	298 28 0.9	27 41.4	152.67	0.32	.9930025	15.1	4 7 48.99
19	19	299 29 4.6	28 45.0	152.63	0.30	.9930398	16.0	4 3 53.08
20	20	300 30 7.3	29 47.6	152.59	0.26	.9930794	17.0	3 59 57.17
21	21	301 31 9.0	30 49.1	152.55	0.19	.9931214	18.0	3 56 1.26
22	22	302 32 9.7	31 49.6	152.51	+0.10	.9931658	19.0	3 52 5.35
23	23	303 33 9.3	32 49.0	152.47	—0.02	.9932127	20.1	3 48 9.44
24	24	304 34 7.9	33 47.5	152.43	0.15	.9932622	21.1	3 44 13.58
25	25	305 35 5.6	34 45.1	152.39	0.28	.9933148	22.2	3 40 17.61
26	26	306 36 2.3	35 41.6	152.35	0.42	.9933690	23.3	3 36 21.70
27	27	307 36 58.1	36 37.2	152.31	0.55	.9934263	24.3	3 32 25.79
28	28	308 37 53.0	37 31.9	152.27	0.66	.9934863	25.4	3 28 29.88
29	29	309 38 47.0	38 25.8	152.33	0.74	.9935489	26.4	3 24 33.97
30	30	310 39 40.1	39 18.8	152.30	0.79	.9936139	27.5	3 20 38.06
31	31	311 40 32.4	40 10.9	152.17	0.81	.9936810	28.4	3 16 42.15
32	32	312 41 23.9	41 2.2	152.14	—0.81	9.9937502	29.2	3 12 46.24

Note. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 9.3	16' 10.2	59' 10.9	+0.32	59' 13.9	+0.21	16 17.5	2.03	20.0
2	16 10.7	16 10.7	59 15.5	+0.09	59 15.7	-0.01	17 6.2	2.05	21.0
3	16 10.3	16 9.7	59 14.7	-0.12	59 12.5	0.21	17 55.9	2.11	22.0
4	16 8.9	16 7.7	59 9.8	0.31	59 5.1	0.39	18 47.7	2.21	23.0
5	16 6.3	16 4.6	58 59.8	0.48	58 53.5	0.57	19 42.2	2.32	24.0
6	16 2.6	16 0.3	58 46.2	0.66	58 37.8	0.75	20 39.3	2.42	25.0
7	15 57.7	15 54.8	58 28.3	0.84	58 17.6	0.94	21 38.2	2.45	26.0
8	15 51.6	15 48.1	58 5.8	1.03	57 52.9	1.12	22 37.1	2.41	27.0
9	15 44.3	15 40.2	57 38.9	1.20	57 24.0	1.28	23 33.8	2.29	28.0
10	15 35.9	15 31.4	57 8.2	1.34	56 51.8	1.38	6		29.0
11	15 26.8	15 22.1	56 34.9	1.41	56 17.8	1.42	0 27.1	2.14	0.4
12	15 17.5	15 12.9	56 0.7	1.41	55 43.9	1.37	1 16.5	1.98	1.4
13	15 8.5	15 4.3	55 27.6	1.31	55 12.2	1.22	2 2.1	1.85	2.4
14	15 0.5	14 57.0	54 58.1	1.11	54 45.4	0.98	2 45.0	1.75	3.4
15	14 54.0	14 51.5	54 34.4	0.83	54 25.3	0.66	3 25.9	1.69	4.4
16	14 49.6	14 48.4	54 18.3	0.48	54 13.6	-0.28	4 6.1	1.68	5.4
17	14 47.7	14 47.8	54 11.3	-0.08	54 11.6	+0.13	4 46.5	1.71	6.4
18	14 48.6	14 50.1	54 14.5	+0.35	54 20.0	0.57	5 28.1	1.78	7.4
19	14 52.3	14 55.3	54 28.2	0.79	54 39.0	1.01	6 12.0	1.89	8.4
20	14 58.9	15 3.2	54 52.3	1.21	55 8.0	1.40	6 58.9	2.02	9.4
21	15 8.0	15 13.4	55 25.9	1.57	55 45.7	1.73	7 49.3	2.17	10.4
22	15 19.3	15 25.6	56 7.3	1.85	56 30.3	1.94	8 43.0	2.29	11.4
23	15 32.1	15 38.7	56 54.2	2.00	57 18.5	2.02	9 39.1	2.36	12.4
24	15 45.3	15 51.8	57 42.8	2.00	58 6.6	1.93	10 36.3	2.37	13.4
25	15 58.0	16 3.8	58 29.3	1.82	58 50.5	1.67	11 32.8	2.32	14.4
26	16 9.0	16 13.5	59 9.6	1.49	59 26.3	1.27	12 27.5	2.24	15.4
27	16 17.3	16 20.3	59 40.2	1.02	59 51.1	0.76	13 20.3	2.17	16.4
28	16 22.4	16 23.6	59 58.8	+0.50	60 3.2	+0.23	14 11.4	2.12	17.4
29	16 23.9	16 23.4	60 4.4	-0.02	60 2.6	-0.26	15 1.8	2.10	18.4
30	16 22.2	16 20.3	59 58.1	0.48	59 51.1	0.67	15 52.4	2.14	19.4
31	16 17.8	16 14.8	59 41.9	0.84	59 30.9	0.97	16 44.4	2.21	20.4
32	16 11.4	16 7.7	59 18.5	-1.08	59 4.9	-1.15	17 38.4	2.29	21.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	10 ^h 29 ^m 58.87 ^s	2.1407	N. 5° 27' 24.5"	15.178	0	12 ^h 12 ^m 16.97 ^s	2.1513	S. 6° 49' 41.4"	15.000
1	10 32 7.25	2.1392	5 12 13.0	15.306	1	12 14 26.10	2.1533	7 4 40.3	14.992
2	10 34 15.55	2.1377	4 56 59.8	15.322	2	12 16 35.36	2.1555	7 19 36.8	14.923
3	10 36 23.77	2.1363	4 41 45.1	15.359	3	12 18 44.75	2.1577	7 34 30.8	14.881
4	10 38 31.91	2.1350	4 26 28.8	15.393	4	12 20 54.28	2.1600	7 49 22.4	14.838
5	10 40 39.97	2.1338	4 11 11.0	15.307	5	12 23 3.95	2.1624	8 4 11.4	14.796
6	10 42 47.95	2.1326	3 55 51.8	15.330	6	12 25 13.77	2.1648	8 18 57.8	14.760
7	10 44 55.87	2.1314	3 40 31.3	15.351	7	12 27 23.73	2.1673	8 33 41.5	14.704
8	10 47 3.72	2.1303	3 25 9.6	15.370	8	12 29 33.84	2.1699	8 48 22.4	14.657
9	10 49 11.51	2.1293	3 9 46.8	15.388	9	12 31 44.11	2.1726	9 3 0.4	14.608
10	10 51 19.25	2.1284	2 54 23.0	15.405	10	12 33 54.54	2.1753	9 17 35.4	14.568
11	10 53 26.93	2.1276	2 38 58.2	15.421	11	12 36 5.14	2.1780	9 32 7.3	14.506
12	10 55 34.56	2.1269	2 23 32.4	15.436	12	12 38 15.91	2.1809	9 46 36.1	14.443
13	10 57 42.15	2.1263	2 8 5.8	15.447	13	12 40 26.85	2.1838	10 1 1.7	14.369
14	10 59 49.71	2.1257	1 52 38.6	15.457	14	12 42 37.96	2.1868	10 15 23.9	14.343
15	11 1 57.23	2.1252	1 37 10.9	15.466	15	12 44 49.26	2.1898	10 29 42.7	14.285
16	11 4 4.72	2.1247	1 21 42.7	15.474	16	12 47 0.74	2.1929	10 43 58.0	14.235
17	11 6 12.19	2.1243	1 6 14.0	15.481	17	12 49 12.41	2.1960	10 58 9.7	14.185
18	11 8 19.64	2.1240	0 50 44.9	15.486	18	12 51 24.27	2.1992	11 12 17.7	14.103
19	11 10 27.07	2.1238	0 35 15.5	15.490	19	12 53 36.32	2.2025	11 26 22.0	14.040
20	11 12 34.49	2.1237	0 19 45.9	15.493	20	12 55 48.57	2.2059	11 40 22.5	13.976
21	11 14 41.91	2.1237	N. 0 4 16.2	15.495	21	12 58 1.03	2.2093	11 54 19.1	13.910
22	11 16 49.33	2.1237	S. 0 11 13.5	15.496	22	13 0 13.69	2.2127	12 8 11.7	13.842
23	11 18 56.75	2.1238	S. 0 26 43.2	15.498	23	13 2 26.56	2.2163	S. 12 22 0.2	13.773
WEDNESDAY 2.					FRIDAY 4.				
0	11 21 4.18	2.1240	S. 0 42 12.7	15.490	0	13 4 39.64	2.2197	S. 12 35 44.4	13.702
1	11 23 11.62	2.1242	0 57 42.0	15.485	1	13 6 52.93	2.2233	12 49 24.4	13.631
2	11 25 19.08	2.1245	1 13 11.0	15.479	2	13 9 6.44	2.2270	13 3 0.1	13.559
3	11 27 26.56	2.1249	1 28 39.6	15.473	3	13 11 20.18	2.2308	13 16 31.4	13.485
4	11 29 34.07	2.1253	1 44 7.7	15.468	4	13 13 34.15	2.2346	13 29 58.3	13.409
5	11 31 41.61	2.1258	1 59 35.2	15.463	5	13 15 48.35	2.2384	13 43 20.6	13.332
6	11 33 49.18	2.1264	2 15 2.1	15.443	6	13 18 2.78	2.2422	13 56 38.2	13.253
7	11 35 56.80	2.1271	2 30 28.3	15.430	7	13 20 17.44	2.2463	14 9 51.0	13.173
8	11 38 4.46	2.1279	2 45 53.7	15.416	8	13 22 32.34	2.2503	14 22 58.8	13.091
9	11 40 12.17	2.1288	3 1 18.2	15.400	9	13 24 47.48	2.2543	14 36 1.7	13.008
10	11 42 19.93	2.1298	3 16 41.7	15.383	10	13 27 2.86	2.2583	14 48 59.7	12.924
11	11 44 27.76	2.1309	3 32 4.2	15.365	11	13 29 18.48	2.2624	15 1 52.6	12.839
12	11 46 35.65	2.1320	3 47 25.5	15.345	12	13 31 34.34	2.2665	15 14 40.3	12.753
13	11 48 43.61	2.1332	4 2 45.6	15.324	13	13 33 50.46	2.2706	15 27 22.7	12.663
14	11 50 51.64	2.1345	4 18 4.4	15.301	14	13 36 6.83	2.2748	15 39 59.8	12.573
15	11 52 59.75	2.1358	4 33 21.7	15.277	15	13 38 23.45	2.2790	15 52 31.5	12.481
16	11 55 7.94	2.1372	4 48 37.6	15.253	16	13 40 40.32	2.2833	16 4 57.6	12.388
17	11 57 16.22	2.1387	5 3 51.9	15.228	17	13 42 57.45	2.2876	16 17 18.1	12.295
18	11 59 24.59	2.1403	5 19 4.6	15.198	18	13 45 14.84	2.2919	16 29 33.0	12.200
19	12 1 33.06	2.1419	5 34 15.6	15.168	19	13 47 32.49	2.2963	16 41 42.1	12.103
20	12 3 41.62	2.1436	5 49 24.7	15.137	20	13 49 50.41	2.3007	16 53 45.3	12.005
21	12 5 50.29	2.1454	6 4 31.9	15.108	21	13 52 8.59	2.3051	17 5 42.6	11.905
22	12 7 59.07	2.1473	6 19 37.1	15.070	22	13 54 27.03	2.3095	17 17 33.9	11.804
23	12 10 7.96	2.1492	6 34 40.3	15.036	23	13 56 45.73	2.3139	17 29 19.1	11.702
24	12 12 16.97	2.1512	S. 6 49 41.4	15.000	24	13 59 4.70	2.3183	S. 17 40 58.1	11.608

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	13 59 4.70	2.3183	S. 17° 40' 58.1	11.506	0	15 55 17.04	2.5073	S. 24° 33' 52.3	5.174
1	14 1 23.94	2.3238	17 52 30.8	11.493	1	15 57 47.55	2.5097	24 38 58.0	5.016
2	14 3 43.45	2.3273	18 3 57.2	11.367	2	16 0 18.20	2.5120	24 43 54.2	4.887
3	14 6 3.23	2.3318	18 15 17.2	11.379	3	16 2 48.99	2.5142	24 48 40.8	4.697
4	14 8 23.28	2.3363	18 26 30.6	11.169	4	16 5 19.91	2.5163	24 53 17.8	4.637
5	14 10 43.60	2.3409	18 37 37.4	11.068	5	16 7 50.95	2.5183	24 57 45.3	4.377
6	14 13 4.19	2.3454	18 48 37.6	10.946	6	16 10 22.11	2.5202	25 2 3.2	4.317
7	14 15 25.05	2.3500	18 59 31.0	10.933	7	16 12 53.38	2.5220	25 6 11.4	4.066
8	14 17 46.19	2.3545	19 10 17.5	10.718	8	16 15 24.75	2.5236	25 10 9.9	3.895
9	14 20 7.60	2.3590	19 20 57.1	10.602	9	16 17 56.21	2.5250	25 13 58.7	3.733
10	14 22 29.28	2.3635	19 31 29.7	10.485	10	16 20 27.76	2.5264	25 17 37.7	3.570
11	14 24 51.23	2.3680	19 41 55.3	10.367	11	16 22 59.39	2.5277	25 21 6.9	3.407
12	14 27 13.45	2.3725	19 52 13.8	10.248	12	16 25 31.10	2.5289	25 24 26.3	3.243
13	14 29 35.94	2.3770	20 2 25.1	10.127	13	16 28 2.88	2.5300	25 27 35.9	3.079
14	14 31 58.70	2.3815	20 12 29.0	10.004	14	16 30 34.72	2.5310	25 30 35.6	2.915
15	14 34 21.72	2.3860	20 22 25.5	9.880	15	16 33 6.61	2.5318	25 33 25.4	2.751
16	14 36 45.01	2.3904	20 32 14.5	9.756	16	16 35 38.54	2.5326	25 36 5.4	2.587
17	14 39 8.57	2.3948	20 41 56.0	9.629	17	16 38 10.51	2.5331	25 38 35.5	2.422
18	14 41 32.39	2.3992	20 51 29.9	9.502	18	16 40 42.51	2.5335	25 40 55.7	2.257
19	14 43 56.47	2.4036	21 0 56.2	9.373	19	16 43 14.53	2.5338	25 43 6.0	2.092
20	14 46 20.82	2.4079	21 10 14.7	9.245	20	16 45 46.56	2.5339	25 45 6.4	1.926
21	14 48 45.43	2.4123	21 19 25.4	9.119	21	16 48 18.59	2.5338	25 46 56.9	1.760
22	14 51 10.29	2.4165	21 28 28.1	8.990	22	16 50 50.62	2.5337	25 48 37.5	1.594
23	14 53 35.41	2.4207	S. 21° 37' 22.9	8.847	23	16 53 22.64	2.5335	S. 25° 50' 8.1	1.428
SUNDAY 6.					TUESDAY 8.				
0	14 56 0.78	2.4249	S. 21° 46' 9.6	8.713	0	16 55 54.65	2.5332	S. 25° 51' 28.7	1.262
1	14 58 26.40	2.4291	21 54 48.2	8.576	1	16 58 26.63	2.5329	25 52 39.4	1.097
2	15 0 52.27	2.4332	22 3 18.6	8.439	2	17 0 58.59	2.5324	25 53 40.2	0.932
3	15 3 18.39	2.4373	22 11 40.8	8.301	3	17 3 30.51	2.5317	25 54 31.1	0.767
4	15 5 44.75	2.4413	22 19 54.7	8.163	4	17 6 2.38	2.5308	25 55 12.1	0.601
5	15 8 11.35	2.4453	22 28 0.2	8.023	5	17 8 34.20	2.5297	25 55 43.2	0.435
6	15 10 38.19	2.4492	22 35 57.3	7.881	6	17 11 5.95	2.5285	25 56 4.4	0.270
7	15 13 5.26	2.4530	22 43 45.9	7.738	7	17 13 37.63	2.5273	25 56 15.6	0.105
8	15 15 32.56	2.4568	22 51 25.8	7.594	8	17 16 9.23	2.5260	25 56 17.0	0.069
9	15 18 0.08	2.4606	22 58 57.1	7.450	9	17 18 40.74	2.5246	25 56 8.5	0.232
10	15 20 27.82	2.4641	23 6 19.8	7.305	10	17 21 12.16	2.5229	25 55 50.2	0.387
11	15 22 55.78	2.4677	23 13 33.7	7.160	11	17 23 43.48	2.5211	25 55 22.1	0.550
12	15 25 23.95	2.4712	23 20 38.8	7.012	12	17 26 14.69	2.5192	25 54 44.2	0.713
13	15 27 52.33	2.4747	23 27 35.0	6.863	13	17 28 45.78	2.5173	25 53 56.5	0.976
14	15 30 20.92	2.4781	23 34 22.3	6.713	14	17 31 16.74	2.5150	25 52 59.0	1.038
15	15 32 49.71	2.4814	23 41 0.6	6.563	15	17 33 47.57	2.5127	25 51 51.9	1.199
16	15 35 18.70	2.4846	23 47 29.9	6.413	16	17 36 18.26	2.5108	25 50 35.1	1.360
17	15 37 47.88	2.4877	23 53 50.1	6.261	17	17 38 48.80	2.5078	25 49 8.7	1.521
18	15 40 17.25	2.4908	24 0 1.2	6.108	18	17 41 19.18	2.5061	25 47 32.6	1.681
19	15 42 46.80	2.4938	24 6 3.0	5.954	19	17 43 49.40	2.5028	25 45 46.9	1.841
20	15 45 16.51	2.4967	24 11 55.5	5.799	20	17 46 19.45	2.4994	25 43 51.6	2.000
21	15 47 46.40	2.4996	24 17 38.7	5.643	21	17 48 49.33	2.4964	25 41 46.8	2.168
22	15 50 16.46	2.5022	24 23 12.6	5.487	22	17 51 19.03	2.4932	25 39 32.6	2.316
23	15 52 46.68	2.5048	24 28 37.1	5.331	23	17 53 48.53	2.4900	25 37 8.9	2.474
24	15 55 17.04	2.5073	S. 24° 33' 52.3	5.174	24	17 56 17.83	2.4867	S. 25° 34' 35.7	2.631

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
WEDNESDAY 9.					FRIDAY 11.				
0	17 56 17.83	2.4897	S. 25° 34' 35.7"	2.631	0	19 50 5.91	2.3281	S. 30° 46' 58.1"	8.302
1	17 58 46.92	2.4932	25 31 53.1	2.786	1	19 52 19.65	2.3298	20 38 1.0	8.002
2	18 1 15.80	2.4797	25 29 1.3	2.940	2	19 54 33.01	2.3196	20 28 57.8	8.101
3	18 3 44.47	2.4760	25 26 0.3	3.093	3	19 56 45.99	2.3182	20 19 48.7	8.199
4	18 6 12.92	2.4723	25 22 50.1	3.246	4	19 58 58.59	2.3098	20 10 33.8	8.296
5	18 8 41.13	2.4682	25 19 30.7	3.399	5	20 1 10.81	2.3006	20 1 13.2	8.393
6	18 11 9.10	2.4641	25 16 2.1	3.551	6	20 3 22.65	2.2943	19 51 47.1	8.483
7	18 13 36.82	2.4600	25 12 24.5	3.701	7	20 5 34.12	2.2880	19 42 15.4	8.573
8	18 16 4.30	2.4558	25 8 37.9	3.850	8	20 7 45.21	2.2817	19 32 38.2	8.663
9	18 18 31.52	2.4516	25 4 42.3	3.999	9	20 9 55.93	2.2754	19 22 55.6	8.753
10	18 20 58.48	2.4471	25 0 37.9	4.147	10	20 12 6.27	2.2692	19 13 7.7	8.841
11	18 23 25.17	2.4426	24 56 24.6	4.294	11	20 14 16.24	2.2630	19 3 14.6	8.930
12	18 25 51.59	2.4380	24 52 2.5	4.440	12	20 16 25.83	2.2567	18 53 16.3	9.014
13	18 28 17.73	2.4333	24 47 31.7	4.586	13	20 18 35.05	2.2506	18 43 12.9	9.098
14	18 30 43.59	2.4285	24 42 52.2	4.730	14	20 20 43.90	2.2444	18 33 4.5	9.180
15	18 33 9.16	2.4238	24 38 4.1	4.871	15	20 22 52.38	2.2383	18 22 51.3	9.260
16	18 35 34.43	2.4187	24 33 7.6	5.012	16	20 25 0.50	2.2322	18 12 33.3	9.340
17	18 37 59.40	2.4137	24 28 2.6	5.153	17	20 27 8.25	2.2262	18 -2 10.5	9.418
18	18 40 24.07	2.4086	24 22 49.2	5.293	18	20 29 15.64	2.2202	17 51 43.0	9.496
19	18 42 48.44	2.4035	24 17 27.4	5.432	19	20 31 22.67	2.2142	17 41 10.9	9.573
20	18 45 12.50	2.3983	24 11 57.3	5.570	20	20 33 29.34	2.2082	17 30 34.2	9.648
21	18 47 36.24	2.3930	24 6 19.0	5.708	21	20 35 35.65	2.2022	17 19 53.1	9.721
22	18 49 59.66	2.3878	24 0 32.6	5.840	22	20 37 41.60	2.0002	17 9 7.6	9.796
23	18 52 22.75	2.3823	S. 23° 54' 38.2"	5.973	23	20 39 47.19	2.0000	S. 16° 58' 17.9"	9.868
THURSDAY 10.					SATURDAY 12.				
0	18 54 45.51	2.3767	S. 23° 48' 35.8"	6.106	0	20 41 52.42	2.0843	S. 16° 47' 24.0"	10.932
1	18 57 7.94	2.3711	23 42 25.5	6.246	1	20 43 57.30	2.0785	16 36 26.0	11.000
2	18 59 30.04	2.3655	23 36 7.3	6.387	2	20 46 1.84	2.0727	16 25 23.9	11.067
3	19 1 51.80	2.3598	23 29 41.4	6.496	3	20 48 6.03	2.0670	16 14 17.8	11.133
4	19 4 13.21	2.3540	23 23 7.8	6.604	4	20 50 9.87	2.0613	16 3 7.7	11.198
5	19 6 34.27	2.3483	23 16 26.6	6.740	5	20 52 13.37	2.0556	15 51 53.8	11.261
6	19 8 54.99	2.3424	23 9 37.8	6.875	6	20 54 16.53	2.0498	15 40 36.2	11.323
7	19 11 15.36	2.3366	23 2 41.5	6.999	7	20 56 19.35	2.0442	15 29 14.9	11.383
8	19 13 35.37	2.3307	22 55 37.8	7.123	8	20 58 21.84	2.0385	15 17 50.1	11.443
9	19 15 55.03	2.3248	22 48 26.8	7.243	9	20 0 24.00	2.0328	15 6 21.7	11.502
10	19 18 14.33	2.3189	22 41 8.6	7.363	10	21 2 25.83	2.0270	14 54 49.8	11.560
11	19 20 33.27	2.3127	22 33 43.2	7.483	11	21 4 27.33	2.0212	14 43 14.5	11.616
12	19 22 51.85	2.3065	22 26 10.7	7.600	12	21 6 28.51	2.0170	14 31 35.8	11.671
13	19 25 10.06	2.3005	22 18 31.2	7.716	13	21 8 29.37	2.0117	14 19 53.9	11.726
14	19 27 27.91	2.2944	22 10 44.8	7.830	14	21 10 29.91	2.0065	14 8 8.8	11.777
15	19 29 45.39	2.2883	22 2 51.6	7.943	15	21 12 30.14	2.0012	13 56 20.6	11.826
16	19 32 2.50	2.2823	21 54 51.7	8.063	16	21 14 30.06	1.9951	13 44 29.3	11.873
17	19 34 19.24	2.2760	21 46 45.1	8.184	17	21 16 29.67	1.9890	13 32 35.1	11.927
18	19 36 35.61	2.2698	21 38 31.8	8.274	18	21 18 28.97	1.9830	13 20 38.0	11.976
19	19 38 51.60	2.2636	21 30 12.0	8.363	19	21 20 27.97	1.9768	13 8 38.0	12.023
20	19 41 7.21	2.2573	21 21 45.8	8.490	20	21 22 26.68	1.9706	12 56 35.1	12.069
21	19 43 22.44	2.2509	21 13 13.2	8.595	21	21 24 25.10	1.9710	12 44 29.5	12.114
22	19 45 37.30	2.2445	21 4 34.3	8.689	22	21 26 23.22	1.9652	12 32 21.4	12.167
23	19 47 51.79	2.2380	20 55 49.2	8.801	23	21 28 21.04	1.9614	12 20 10.7	12.190
24	19 50 5.91	2.2321	S. 20° 46' 58.1"	8.903	24	21 30 18.58	1.9597	S. 12° 7' 57.5"	12.240

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	21 30 18.58	1.9067	S. 18° 7' 57.5	12.940	0	22 59 59.13	1.9083	S. 1° 51' 3.1	13.128
1	21 32 15.84	1.9071	11 55 41.8	12.980	1	23 1 47.41	1.9088	1 37 55.4	13.127
2	21 34 12.82	1.9475	11 43 23.7	12.920	2	23 3 35.59	1.9093	1 24 47.8	13.126
3	21 36 9.53	1.9480	11 31 3.2	12.860	3	23 5 23.68	1.9099	1 11 40.4	13.122
4	21 38 5.97	1.9385	11 18 40.5	12.800	4	23 7 11.69	1.7996	0 58 33.2	13.118
5	21 40 2.14	1.9340	11 6 15.6	12.432	5	23 8 59.63	1.7984	0 45 26.2	13.114
6	21 41 58.05	1.9286	10 53 48.6	12.467	6	23 10 47.50	1.7973	0 32 19.5	13.109
7	21 43 53.70	1.9263	10 41 19.5	12.501	7	23 12 35.20	1.7962	0 19 13.1	13.103
8	21 45 49.09	1.9211	10 28 48.4	12.534	8	23 14 23.03	1.7952	S. 0 6 7.1	13.097
9	21 47 44.23	1.9169	10 16 15.3	12.566	9	23 16 10.70	1.7942	N. 0 6 58.5	13.090
10	21 49 39.12	1.9128	10 3 40.4	12.597	10	23 17 58.32	1.7933	0 20 3.7	13.082
11	21 51 33.76	1.9087	9 51 3.6	12.627	11	23 19 45.89	1.7925	0 33 8.5	13.074
12	21 53 28.16	1.9047	9 38 25.0	12.656	12	23 21 33.42	1.7918	0 46 12.7	13.066
13	21 55 22.32	1.9008	9 25 44.7	12.685	13	23 23 20.91	1.7912	0 59 16.3	13.058
14	21 57 16.25	1.8970	9 13 2.7	12.713	14	23 25 8.26	1.7906	1 12 19.3	13.048
15	21 59 9.95	1.8932	9 0 19.1	12.740	15	23 26 55.77	1.7900	1 25 21.7	13.034
16	22 1 3.43	1.8895	8 47 34.0	12.765	16	23 28 43.14	1.7895	1 38 23.4	13.022
17	22 2 56.68	1.8858	8 34 47.4	12.789	17	23 30 30.49	1.7891	1 51 24.4	13.010
18	22 4 49.71	1.8821	8 21 59.3	12.812	18	23 32 17.82	1.7886	2 4 24.7	12.997
19	22 6 42.53	1.8785	8 9 9.8	12.835	19	23 34 5.13	1.7885	2 17 24.1	12.983
20	22 8 35.14	1.8750	7 56 19.0	12.857	20	23 35 52.43	1.7883	2 30 22.7	12.968
21	22 10 27.54	1.8716	7 43 27.0	12.878	21	23 37 39.72	1.7881	2 43 20.4	12.954
22	22 12 19.74	1.8680	7 30 33.7	12.898	22	23 39 27.00	1.7880	2 56 17.2	12.939
23	22 14 11.74	1.8641	S. 7 17 39.2	12.917	23	23 41 14.28	1.7880	N. 3 9 13.1	12.923
MONDAY 14.					WEDNESDAY 16.				
0	22 16 3.55	1.8619	S. 7 4 43.6	12.935	0	23 43 1.56	1.7880	N. 3 22 8.0	12.907
1	22 17 55.17	1.8586	6 51 46.9	12.963	1	23 44 48.85	1.7881	3 35 1.8	12.890
2	22 19 46.60	1.8557	6 38 49.2	12.970	2	23 46 36.15	1.7883	3 47 54.6	12.872
3	22 21 37.85	1.8527	6 25 50.5	12.985	3	23 48 23.46	1.7886	4 0 46.3	12.853
4	22 23 28.92	1.8498	6 12 51.0	12.999	4	23 50 10.80	1.7890	4 13 36.9	12.833
5	22 25 19.82	1.8470	5 59 50.6	13.012	5	23 51 58.16	1.7895	4 26 26.3	12.813
6	22 27 10.55	1.8442	5 46 49.4	13.025	6	23 53 45.55	1.7900	4 39 14.4	12.792
7	22 29 1.11	1.8414	5 33 47.4	13.038	7	23 55 32.97	1.7906	4 52 1.2	12.770
8	22 30 51.51	1.8387	5 20 44.7	13.050	8	23 57 20.43	1.7913	5 4 46.7	12.748
9	22 32 41.75	1.8361	5 7 41.3	13.061	9	23 59 7.93	1.7920	5 17 30.9	12.726
10	22 34 31.83	1.8336	4 54 37.3	13.071	10	0 0 55.47	1.7927	5 30 13.7	12.702
11	22 36 21.76	1.8310	4 41 32.8	13.080	11	0 2 43.05	1.7935	5 42 55.1	12.678
12	22 38 11.55	1.8286	4 28 27.7	13.088	12	0 4 30.68	1.7943	5 55 35.1	12.653
13	22 40 1.20	1.8263	4 15 22.1	13.096	13	0 6 18.37	1.7953	6 8 13.6	12.628
14	22 41 50.71	1.8241	4 2 16.1	13.103	14	0 8 6.12	1.7963	6 20 50.5	12.602
15	22 43 40.09	1.8219	3 49 9.8	13.109	15	0 9 53.94	1.7974	6 33 25.9	12.576
16	22 45 29.33	1.8198	3 36 3.1	13.114	16	0 11 41.82	1.7985	6 45 59.7	12.550
17	22 47 18.45	1.8177	3 22 56.1	13.118	17	0 13 29.77	1.7996	6 58 31.9	12.523
18	22 49 7.45	1.8157	3 9 48.9	13.122	18	0 15 17.80	1.8011	7 11 2.4	12.496
19	22 50 56.33	1.8138	2 56 41.5	13.126	19	0 17 5.91	1.8025	7 23 31.1	12.468
20	22 52 45.10	1.8120	2 43 33.9	13.127	20	0 18 54.11	1.8039	7 35 58.1	12.438
21	22 54 33.76	1.8102	2 30 26.3	13.128	21	0 20 42.40	1.8055	7 48 23.3	12.406
22	22 56 22.31	1.8086	2 17 18.6	13.128	22	0 22 30.78	1.8070	8 0 46.7	12.375
23	22 58 10.76	1.8069	2 4 10.9	13.128	23	0 24 19.24	1.8086	8 13 8.2	12.344
24	22 59 59.13	1.8053	S. 1 51 3.1	13.128	24	0 26 7.80	1.8102	N. 8 25 27.9	12.312

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	^h 0 ^m 26 ^s 7.80	1.8109	N. 8° 25' 27.9"	12.312	0	^h 1 ^m 56 ^s 10.89	1.9645	N. 17° 26' 34.4"	9.966
1	0 27 56.46	1.8120	8 37 45.6	12.279	1	1 58 8.90	1.9691	17 36 29.9	9.990
2	0 29 45.24	1.8139	8 50 1.3	12.246	2	2 0 7.19	1.9738	17 46 21.3	9.991
3	0 31 34.14	1.8168	9 2 15.0	12.211	3	2 2 5.76	1.9785	17 56 8.5	9.981
4	0 33 23.15	1.8178	9 14 26.6	12.177	4	2 4 4.61	1.9832	18 5 51.4	9.980
5	0 35 12.28	1.8198	9 26 36.1	12.142	5	2 6 3.74	1.9879	18 15 30.1	9.969
6	0 37 1.53	1.8219	9 38 43.5	12.106	6	2 8 3.16	1.9927	18 25 4.5	9.958
7	0 38 50.90	1.8241	9 50 48.7	12.069	7	2 10 2.87	1.9975	18 34 34.7	9.946
8	0 40 40.41	1.8263	10 2 51.7	12.032	8	2 12 2.88	2.0024	18 44 0.5	9.933
9	0 42 30.06	1.8286	10 14 52.4	11.994	9	2 14 3.18	2.0072	18 53 21.8	9.918
10	0 44 19.84	1.8309	10 26 50.8	11.955	10	2 16 3.77	2.0120	19 2 38.6	9.942
11	0 46 9.76	1.8333	10 38 46.9	11.915	11	2 18 4.66	2.0178	19 11 50.8	9.166
12	0 47 59.83	1.8367	10 50 40.6	11.875	12	2 20 5.85	2.0228	19 20 58.4	9.086
13	0 49 50.05	1.8382	11 2 31.9	11.834	13	2 22 7.34	2.0278	19 30 1.3	9.010
14	0 51 40.43	1.8408	11 14 20.7	11.793	14	2 24 9.14	2.0324	19 38 59.5	8.992
15	0 53 30.96	1.8435	11 26 7.0	11.751	15	2 26 11.25	2.0376	19 47 53.0	8.969
16	0 55 21.65	1.8462	11 37 50.8	11.708	16	2 28 13.67	2.0428	19 56 41.6	8.770
17	0 57 12.51	1.8490	11 49 32.0	11.665	17	2 30 16.40	2.0480	20 5 25.3	8.687
18	0 59 3.54	1.8519	12 1 10.6	11.622	18	2 32 19.44	2.0533	20 14 4.0	8.603
19	1 0 54.74	1.8548	12 12 46.6	11.579	19	2 34 22.80	2.0587	20 22 37.7	8.519
20	1 2 46.12	1.8578	12 24 19.9	11.533	20	2 36 26.48	2.0640	20 31 6.4	8.435
21	1 4 37.68	1.8609	12 35 50.4	11.486	21	2 38 30.48	2.0693	20 39 30.0	8.350
22	1 6 29.43	1.8640	12 47 18.1	11.438	22	2 40 34.80	2.0746	20 47 48.4	8.263
23	1 8 21.37	1.8673	N. 12° 58' 42.9"	11.390	23	2 42 39.43	2.0798	N. 20° 56' 1.5"	8.175
FRIDAY 18.					SUNDAY 20.				
0	1 10 13.49	1.8704	N. 13° 10' 4.9"	11.342	0	2 44 44.38	2.0653	N. 21° 4' 9.3"	8.087
1	1 12 5.81	1.8737	13 21 24.0	11.293	1	2 46 49.66	2.0697	21 12 11.8	7.997
2	1 13 58.33	1.8770	13 32 40.1	11.248	2	2 48 55.27	2.0691	21 20 8.9	7.907
3	1 15 51.05	1.8804	13 43 53.2	11.193	3	2 51 1.20	2.1016	21 28 0.5	7.816
4	1 17 43.98	1.8838	13 55 3.3	11.142	4	2 53 7.46	2.1070	21 35 46.6	7.722
5	1 19 37.12	1.8873	14 6 10.3	11.090	5	2 55 14.05	2.1126	21 43 27.1	7.628
6	1 21 30.47	1.8909	14 17 14.1	11.037	6	2 57 20.97	2.1180	21 51 2.0	7.533
7	1 23 24.03	1.8945	14 28 14.7	10.983	7	2 59 28.22	2.1236	21 58 31.2	7.438
8	1 25 17.81	1.8982	14 39 12.1	10.929	8	3 1 35.81	2.1292	22 5 54.6	7.342
9	1 27 11.81	1.9019	14 50 6.2	10.874	9	3 3 43.73	2.1348	22 13 12.2	7.246
10	1 29 6.04	1.9057	15 0 57.0	10.818	10	3 5 51.99	2.1404	22 20 23.9	7.147
11	1 31 0.50	1.9096	15 11 44.5	10.762	11	3 8 0.58	2.1460	22 27 29.7	7.047
12	1 32 55.20	1.9136	15 22 28.6	10.706	12	3 10 9.51	2.1516	22 34 29.5	6.947
13	1 34 50.14	1.9176	15 33 9.2	10.649	13	3 12 18.77	2.1570	22 41 23.2	6.846
14	1 36 45.31	1.9216	15 43 46.3	10.590	14	3 14 28.36	2.1625	22 48 10.8	6.742
15	1 38 40.72	1.9256	15 54 19.8	10.530	15	3 16 38.28	2.1681	22 54 52.2	6.638
16	1 40 36.38	1.9297	16 4 49.8	10.470	16	3 18 48.54	2.1737	23 1 27.4	6.534
17	1 42 32.29	1.9339	16 15 16.2	10.409	17	3 20 59.13	2.1793	23 7 56.3	6.429
18	1 44 28.45	1.9381	16 25 38.9	10.347	18	3 23 10.06	2.1848	23 14 18.8	6.322
19	1 46 24.87	1.9424	16 35 57.8	10.283	19	3 25 21.32	2.1903	23 20 34.8	6.214
20	1 48 21.54	1.9468	16 46 12.8	10.219	20	3 27 32.91	2.1968	23 26 44.3	6.106
21	1 50 18.48	1.9512	16 56 24.0	10.155	21	3 29 44.83	2.2014	23 32 47.3	5.996
22	1 52 15.68	1.9556	17 6 31.4	10.090	22	3 31 57.08	2.2070	23 38 43.6	5.884
23	1 54 13.15	1.9600	17 16 34.9	10.025	23	3 34 9.67	2.2126	23 44 33.4	5.773
24	1 56 10.89	1.9645	N. 17° 26' 34.4"	9.958	24	3 36 22.59	2.2180	N. 23° 50' 16.5"	5.661

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23.				
0	3 36 22.59	2.2180	N.23° 50' 16.5	5.661	0	5 28 24.89	2.4260	N.25° 54' 4.5	0.231
1	3 38 35.84	2.2286	23 55 52.8	5.647	1	5 30 50.53	2.4266	25 53 10.7	0.973
2	3 40 49.42	2.2390	24 1 22.1	5.482	2	5 33 16.31	2.4306	25 52 7.7	1.196
3	3 43 3.32	2.2344	24 6 44.5	5.316	3	5 35 42.23	2.4330	25 50 55.5	1.379
4	3 45 17.55	2.2398	24 11 59.9	5.199	4	5 38 8.27	2.4351	25 49 34.1	1.433
5	3 47 32.10	2.2462	24 17 8.3	5.081	5	5 40 34.44	2.4372	25 48 3.5	1.587
6	3 49 46.97	2.2508	24 22 9.6	4.962	6	5 43 0.73	2.4392	25 46 23.6	1.742
7	3 52 2.16	2.2550	24 27 3.8	4.843	7	5 45 27.14	2.4410	25 44 34.4	1.897
8	3 54 17.67	2.2612	24 31 50.8	4.725	8	5 47 53.65	2.4437	25 42 35.9	2.062
9	3 56 33.50	2.2665	24 36 30.5	4.602	9	5 50 20.26	2.4443	25 40 28.1	2.207
10	3 58 49.65	2.2717	24 41 2.8	4.479	10	5 52 46.96	2.4468	25 38 11.0	2.362
11	4 1 6.11	2.2769	24 45 27.8	4.365	11	5 55 13.76	2.4473	25 35 44.5	2.518
12	4 3 22.88	2.2831	24 49 45.3	4.230	12	5 57 40.65	2.4487	25 33 8.8	2.674
13	4 5 39.96	2.2872	24 53 55.3	4.104	13	6 0 7.62	2.4499	25 30 23.7	2.830
14	4 7 57.34	2.2923	24 57 57.7	3.977	14	6 2 34.65	2.4509	25 27 29.2	2.986
15	4 10 15.03	2.2975	25 1 52.5	3.849	15	6 5 1.73	2.4518	25 24 25.3	3.143
16	4 12 33.02	2.3028	25 5 39.6	3.721	16	6 7 28.86	2.4526	25 21 12.0	3.300
17	4 14 51.31	2.3072	25 9 19.0	3.592	17	6 9 56.04	2.4534	25 17 49.3	3.457
18	4 17 9.89	2.3121	25 12 50.6	3.462	18	6 12 23.28	2.4542	25 14 17.3	3.613
19	4 19 28.76	2.3169	25 16 14.4	3.330	19	6 14 50.56	2.4549	25 10 35.9	3.769
20	4 21 47.92	2.3217	25 19 30.2	3.197	20	6 17 17.87	2.4554	25 6 45.1	3.925
21	4 24 7.37	2.3265	25 22 38.0	3.064	21	6 19 45.21	2.4566	25 2 44.9	4.082
22	4 26 27.10	2.3312	25 25 37.8	2.931	22	6 22 12.56	2.4580	24 58 35.3	4.238
23	4 28 47.10	2.3368	N.25° 28' 29.7	2.797	23	6 24 39.92	2.4592	N.24° 54' 16.3	4.396
TUESDAY 22.					THURSDAY 24.				
0	4 31 7.38	2.3403	N.25° 31' 13.5	2.662	0	6 27 7.29	2.4592	N.24° 49' 48.0	4.451
1	4 33 27.93	2.3447	25 33 49.1	2.525	1	6 29 34.66	2.4591	24 45 10.3	4.707
2	4 35 48.74	2.3491	25 36 16.4	2.387	2	6 32 2.02	2.4590	24 40 23.3	4.962
3	4 38 9.82	2.3535	25 38 35.4	2.248	3	6 34 29.38	2.4588	24 35 26.9	5.017
4	4 40 31.16	2.3578	25 40 46.1	2.109	4	6 36 56.72	2.4586	24 30 21.2	5.172
5	4 42 52.75	2.3620	25 42 48.4	1.969	5	6 39 24.04	2.4580	24 25 6.2	5.327
6	4 45 14.59	2.3660	25 44 42.3	1.829	6	6 41 51.33	2.4574	24 19 41.9	5.481
7	4 47 36.67	2.3700	25 46 27.8	1.688	7	6 44 18.58	2.4577	24 14 8.4	5.635
8	4 49 59.00	2.3739	25 48 4.8	1.546	8	6 46 45.78	2.4580	24 8 25.7	5.789
9	4 52 21.56	2.3778	25 49 33.2	1.403	9	6 49 12.93	2.4582	24 2 33.7	5.943
10	4 54 44.35	2.3817	25 50 53.0	1.259	10	6 51 40.04	2.4584	23 56 32.5	6.096
11	4 57 7.37	2.3855	25 52 4.1	1.114	11	6 54 7.10	2.4595	23 50 22.1	6.249
12	4 59 30.62	2.3892	25 53 6.6	0.969	12	6 56 34.10	2.4596	23 44 2.6	6.401
13	5 1 54.09	2.3928	25 54 0.4	0.823	13	6 59 1.03	2.4593	23 37 34.0	6.553
14	5 4 17.77	2.3963	25 54 45.4	0.676	14	7 1 27.88	2.4570	23 30 56.2	6.704
15	5 6 41.65	2.3997	25 55 21.5	0.529	15	7 3 54.65	2.4555	23 24 9.4	6.856
16	5 9 5.72	2.4029	25 55 48.8	0.381	16	7 6 21.23	2.4540	23 17 13.5	7.006
17	5 11 29.99	2.4061	25 56 7.2	0.233	17	7 8 47.92	2.4525	23 10 8.6	7.156
18	5 13 54.45	2.4092	25 56 16.7	0.084	18	7 11 14.43	2.4509	23 2 54.8	7.304
19	5 16 19.10	2.4122	25 56 17.3	0.065	19	7 13 40.84	2.4392	22 55 32.1	7.452
20	5 18 43.92	2.4151	25 56 8.9	0.215	20	7 16 7.14	2.4375	22 48 0.5	7.600
21	5 21 8.91	2.4179	25 55 51.4	0.366	21	7 18 33.33	2.4357	22 40 20.1	7.747
22	5 23 34.07	2.4207	25 55 24.8	0.518	22	7 20 59.41	2.4337	22 32 30.9	7.893
23	5 25 59.40	2.4234	25 54 49.2	0.669	23	7 23 25.37	2.4317	22 24 32.9	8.038
24	5 28 24.89	2.4260	N.25° 54' 4.5	0.821	24	7 25 51.22	2.4297	N.22° 16' 26.2	8.183

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	7 ^h 25 ^m 51.22 ^s	2.4297	N. 23° 16' 26.2"	8.188	0	9 ^h 19 ^m 14.56 ^s	2.3871	N. 13° 16' 47.9"	13.812
1	7 28 16.94	2.4277	22 8 10.9	8.227	1	9 21 31.69	2.3846	13 2 56.7	13.895
2	7 30 42.53	2.4255	21 59 47.0	8.470	2	9 23 48.64	2.3810	12 49 0.5	13.977
3	7 33 7.99	2.4232	21 51 14.4	8.618	3	9 26 5.41	2.3780	12 34 59.4	14.067
4	7 35 33.31	2.4208	21 42 33.3	8.765	4	9 28 22.00	2.3750	12 20 53.6	14.185
5	7 37 58.49	2.4184	21 33 43.8	8.895	5	9 30 38.41	2.3731	12 6 43.1	14.218
6	7 40 23.52	2.4160	21 24 45.9	9.034	6	9 32 54.64	2.3683	11 52 28.0	14.389
7	7 42 48.40	2.4135	21 15 39.7	9.172	7	9 35 10.70	2.3658	11 38 8.4	14.563
8	7 45 12.13	2.4109	21 6 25.2	9.310	8	9 37 26.59	2.3633	11 23 44.4	14.635
9	7 47 37.71	2.4083	20 57 2.4	9.447	9	9 39 42.31	2.3607	11 9 16.1	14.805
10	7 50 2.13	2.4056	20 47 31.4	9.583	10	9 41 57.86	2.3578	10 54 43.6	14.978
11	7 52 26.38	2.4030	20 37 52.4	9.717	11	9 44 13.25	2.3552	10 40 7.1	14.640
12	7 54 50.47	2.4003	20 28 5.4	9.850	12	9 46 28.48	2.3523	10 25 26.7	14.706
13	7 57 14.39	2.3974	20 18 10.4	9.983	13	9 48 43.55	2.3496	10 10 42.4	14.770
14	7 59 38.15	2.3946	20 8 7.4	10.116	14	9 50 58.45	2.3472	9 55 54.3	14.832
15	8 2 1.74	2.3917	19 57 56.5	10.245	15	9 53 13.20	2.3447	9 41 2.5	14.893
16	8 4 25.15	2.3887	19 47 37.8	10.375	16	9 55 27.80	2.3422	9 26 7.2	14.952
17	8 6 48.38	2.3857	19 37 11.4	10.503	17	9 57 42.55	2.3397	9 11 8.4	15.009
18	8 8 11.43	2.3827	19 26 37.4	10.630	18	9 59 56.55	2.3373	8 56 6.1	15.065
19	8 11 34.31	2.3797	19 15 55.8	10.756	19	10 2 10.71	2.3348	8 41 0.6	15.119
20	8 13 57.01	2.3767	19 5 6.7	10.880	20	10 4 24.73	2.3323	8 25 52.0	15.171
21	8 16 19.52	2.3737	18 54 10.2	11.003	21	10 6 38.61	2.3293	8 10 40.2	15.222
22	8 18 41.84	2.3706	18 43 6.3	11.125	22	10 8 52.36	2.3268	7 55 25.4	15.271
23	8 21 3.97	2.3678	N. 18° 31' 55.2"	11.245	23	10 11 5.98	2.3246	N. 7° 40' 7.7"	15.318
SATURDAY 26.					MONDAY 28.				
0	8 23 25.91	2.3649	N. 18° 20' 36.9"	11.364	0	10 13 19.47	2.3227	N. 7° 24' 47.2"	15.363
1	8 25 47.66	2.3610	18 9 11.5	11.482	1	10 15 32.83	2.3217	7 9 24.0	15.407
2	8 28 9.22	2.3578	17 57 39.0	11.599	2	10 17 46.07	2.3197	6 53 58.2	15.449
3	8 30 30.59	2.3547	17 45 59.5	11.715	3	10 19 59.19	2.3178	6 38 30.0	15.489
4	8 32 51.78	2.3515	17 34 13.1	11.829	4	10 22 12.20	2.3160	6 22 50.5	15.527
5	8 35 12.77	2.3482	17 22 19.9	11.943	5	10 24 25.10	2.3142	6 7 26.7	15.564
6	8 37 33.56	2.3448	17 10 20.0	12.054	6	10 26 37.89	2.3124	5 51 51.7	15.600
7	8 39 54.16	2.3417	16 58 13.4	12.164	7	10 28 50.57	2.3106	5 36 14.6	15.634
8	8 42 14.57	2.3384	16 46 0.3	12.272	8	10 31 3.15	2.3088	5 20 35.5	15.667
9	8 44 34.78	2.3352	16 33 40.7	12.379	9	10 33 15.63	2.3073	5 4 54.5	15.698
10	8 46 54.79	2.3319	16 21 14.7	12.485	10	10 35 28.02	2.3056	4 49 11.7	15.727
11	8 49 14.60	2.3286	16 8 42.3	12.590	11	10 37 40.32	2.3043	4 33 27.2	15.754
12	8 51 34.22	2.3253	15 56 3.7	12.693	12	10 39 52.53	2.3029	4 17 41.2	15.779
13	8 53 53.64	2.3220	15 43 19.0	12.795	13	10 42 4.66	2.3015	4 1 53.7	15.803
14	8 56 12.87	2.3188	15 30 28.2	12.896	14	10 44 16.71	2.3002	3 46 4.8	15.825
15	8 58 31.90	2.3155	15 17 31.5	12.995	15	10 46 28.68	2.2990	3 30 14.6	15.846
16	9 0 50.74	2.3123	15 4 28.9	13.092	16	10 48 40.58	2.2979	3 14 23.3	15.864
17	9 3 9.39	2.3092	14 51 20.5	13.187	17	10 50 52.42	2.2968	2 58 30.9	15.881
18	9 5 27.84	2.3060	14 38 6.4	13.280	18	10 53 4.20	2.2958	2 42 37.5	15.896
19	9 7 46.10	2.3028	14 24 46.8	13.372	19	10 55 15.92	2.2949	2 26 43.3	15.910
20	9 10 4.17	2.2997	14 11 21.7	13.463	20	10 57 27.58	2.2940	2 10 48.3	15.922
21	9 12 22.05	2.2966	13 57 51.1	13.553	21	10 59 39.19	2.2932	1 54 52.6	15.933
22	9 14 39.74	2.2933	13 44 15.2	13.641	22	11 1 50.75	2.2924	1 38 56.3	15.942
23	9 16 57.24	2.2902	13 30 34.1	13.727	23	11 4 2.27	2.2917	1 22 59.6	15.949
24	9 19 14.56	2.2871	N. 13° 16' 47.9"	13.812	24	11 6 13.74	2.2911	N. 1° 7' 2.5"	15.954

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					THURSDAY 31.				
0	h m s 11 6 13.74	2.1911	N. 1° 7' 2.5"	15.954	0	h m s 12 51 59.05	2.2406	S. 11° 14' 23.4"	14.337
1	11 8 25.18	2.1905	0 51 5.1	15.958	1	12 54 13.57	2.2422	11 28 41.5	14.366
2	11 10 36.59	2.1900	0 35 7.5	15.960	2	12 56 28.24	2.2446	11 42 55.3	14.193
3	11 12 47.98	2.1898	0 19 9.9	15.960	3	12 58 43.07	2.2488	11 57 4.6	14.118
4	11 14 59.35	2.1898	N. 0 3 12.3	15.959	4	13 0 58.06	2.2513	12 11 9.4	14.043
5	11 17 10.70	2.1891	S. 0 12 45.3	15.957	5	13 3 13.21	2.2539	12 25 9.6	13.965
6	11 19 22.03	2.1889	0 28 42.7	15.953	6	13 5 28.53	2.2567	12 39 5.1	13.987
7	11 21 33.35	2.1887	0 44 39.7	15.947	7	13 7 44.02	2.2598	12 52 56.0	13.906
8	11 23 44.66	2.1886	1 0 36.2	15.939	8	13 9 59.69	2.2625	13 6 42.1	13.737
9	11 25 55.97	2.1886	1 16 32.2	15.939	9	13 12 15.53	2.2655	13 20 23.3	13.644
10	11 28 7.28	2.1886	1 32 27.6	15.919	10	13 14 31.55	2.2686	13 33 59.4	13.659
11	11 30 18.60	2.1887	1 48 22.4	15.907	11	13 16 47.75	2.2715	13 47 30.4	13.473
12	11 32 29.93	2.1889	2 4 16.4	15.893	12	13 19 4.13	2.2745	14 0 56.2	13.396
13	11 34 41.27	2.1892	2 20 9.5	15.877	13	13 21 20.69	2.2776	14 14 16.8	13.299
14	11 36 52.63	2.1895	2 36 1.5	15.859	14	13 23 37.44	2.2807	14 27 32.1	13.210
15	11 39 4.01	2.1899	2 51 52.5	15.840	15	13 25 54.38	2.2838	14 40 41.9	13.119
16	11 41 15.42	2.1904	3 7 42.3	15.819	16	13 28 11.51	2.2870	14 53 46.2	13.026
17	11 43 26.86	2.1910	3 23 30.8	15.797	17	13 30 28.83	2.2902	15 6 44.9	12.933
18	11 45 38.34	2.1917	3 39 17.9	15.773	18	13 32 46.34	2.2933	15 19 37.9	12.837
19	11 47 49.86	2.1924	3 55 3.6	15.748	19	13 35 4.05	2.2968	15 32 25.3	12.741
20	11 50 1.43	2.1932	4 10 47.7	15.721	20	13 37 21.96	2.3003	15 45 6.9	12.643
21	11 52 13.05	2.1940	4 26 30.1	15.693	21	13 39 40.07	2.3036	15 57 42.5	12.543
22	11 54 24.71	2.1948	4 42 10.8	15.663	22	13 41 58.38	2.3068	16 10 12.1	12.443
23	11 56 36.43	2.1956	S. 4 57 49.6	15.631	23	13 44 16.89	2.3102	S. 16 22 35.7	12.343
WEDNESDAY 30.					FRIDAY, FEBRUARY 1.				
0	11 58 48.21	2.1968	S. 5 13 26.4	15.597	0	13 46 35.61	2.3137	S. 16 34 53.1	12.239
1	12 1 0.05	2.1979	5 29 1.1	15.562					
2	12 3 11.96	2.1991	5 44 33.7	15.526					
3	12 5 23.95	2.2004	6 0 4.2	15.488					
4	12 7 36.01	2.2017	6 15 32.4	15.449					
5	12 9 48.15	2.2031	6 30 58.1	15.408					
6	12 12 0.38	2.2045	6 46 21.3	15.365					
7	12 14 12.69	2.2060	7 1 41.8	15.320					
8	12 16 25.09	2.2075	7 16 59.6	15.274					
9	12 18 37.59	2.2091	7 32 14.6	15.227					
10	12 20 50.19	2.2108	7 47 26.8	15.178					
11	12 23 2.89	2.2126	8 2 36.0	15.128					
12	12 25 15.70	2.2143	8 17 42.1	15.076					
13	12 27 28.62	2.2162	8 32 45.0	15.023					
14	12 29 41.65	2.2182	8 47 44.7	14.968					
15	12 31 54.80	2.2202	9 2 41.1	14.913					
16	12 34 8.07	2.2222	9 17 34.1	14.854					
17	12 36 21.47	2.2243	9 32 23.6	14.794					
18	12 38 35.00	2.2265	9 47 9.5	14.733					
19	12 40 48.66	2.2288	10 1 51.6	14.670					
20	12 43 2.46	2.2311	10 16 29.8	14.605					
21	12 45 16.40	2.2334	10 31 4.1	14.539					
22	12 47 30.47	2.2357	10 45 34.5	14.473					
23	12 49 44.68	2.2381	11 0 1.0	14.406					
24	12 51 59.05	2.2406	S. 11 14 23.4	14.337					

PHASES OF THE MOON.

☾ Last Quarter, . .	d h m	3 13 54.9
● New Moon, . .	10 15 27.4	
☾ First Quarter, . .	18 16 0.0	
○ Full Moon, . . .	26 5 5.7	

☾ Perigee,	d h	2 8.0
☾ Apogee,	17 5.6	
☾ Perigee,	28 22.8	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Pollux W.	46° 55' 48"	2344	48° 40' 44"	2340	50° 25' 45"	2337	52° 10' 50"	2334
	Spica E.	44 43 3	2307	42 57 13	2307	41 11 24	2307	39 25 35	2306
	Antares E.	90 22 3	2303	88 35 53	2303	86 49 42	2291	85 3 29	2291
	Venus E.	92 26 12	2706	90 49 40	2704	89 13 6	2704	87 36 31	2703
	SUN E.	123 53 57	2617	122 15 25	2616	120 36 52	2615	118 58 18	2614
2	Pollux W.	60 57 12	2326	62 42 35	2324	64 27 59	2324	66 13 24	2324
	Jupiter W.	25 34 40	2320	27 20 11	2314	29 5 50	2310	30 51 35	2306
	Regulus W.	23 55 44	2326	25 40 51	2320	27 26 7	2326	29 11 29	2322
	Spica E.	30 36 56	2317	28 51 21	2320	27 5 51	2325	25 20 28	2321
	Antares E.	76 12 15	2299	74 26 0	2299	72 39 45	2290	70 53 31	2291
	Venus E.	79 33 22	2701	77 56 43	2701	76 20 5	2701	74 43 27	2703
	SUN E.	110 45 12	2612	109 6 34	2613	107 27 57	2613	105 49 20	2614
3	Pollux W.	75 0 29	2326	76 45 52	2326	78 31 14	2327	80 16 34	2326
	Jupiter W.	39 41 22	2308	41 27 25	2307	43 13 29	2307	44 59 33	2306
	Regulus W.	37 59 11	2315	39 44 48	2314	41 30 25	2316	43 16 1	2316
	Saturn W.	27 2 34	2323	28 46 35	2374	30 30 47	2367	32 15 9	2362
	Antares E.	62 2 38	2296	60 16 32	2297	58 30 28	2298	56 44 26	2290
	Venus E.	66 40 36	2708	65 4 7	2710	63 27 41	2712	61 51 17	2714
	SUN E.	97 36 31	2618	95 58 1	2621	94 19 34	2622	92 41 9	2624
4	Pollux W.	89 2 44	2337	90 47 50	2339	92 32 52	2343	94 17 51	2344
	Jupiter W.	53 49 41	2303	55 35 38	2303	57 21 33	2305	59 7 25	2307
	Regulus W.	52 3 48	2323	53 49 16	2323	55 34 42	2326	57 20 5	2327
	Saturn W.	40 58 34	2346	42 43 26	2346	44 28 18	2346	46 13 11	2346
	Antares E.	47 54 55	2310	46 9 10	2313	44 23 28	2314	42 37 49	2317
	Venus E.	53 50 4	2727	52 14 0	2730	50 38 0	2733	49 2 4	2737
	SUN E.	84 29 40	2634	82 51 31	2636	81 13 25	2638	79 35 22	2641
5	Jupiter W.	67 56 4	2317	69 41 38	2320	71 27 8	2323	73 12 34	2326
	Regulus W.	66 6 13	2339	67 51 16	2343	69 36 15	2345	71 21 9	2348
	Saturn W.	54 57 26	2360	56 42 12	2363	58 26 56	2364	60 11 37	2366
	Antares E.	33 50 34	2331	32 5 20	2334	30 20 10	2337	28 35 4	2341
	Venus E.	41 3 41	2756	39 28 18	2763	37 53 2	2769	36 17 53	2774
	SUN E.	71 26 4	2655	69 48 24	2659	68 10 49	2663	66 33 19	2666
6	Jupiter W.	81 58 34	2342	83 43 31	2347	85 28 22	2350	87 13 8	2356
	Regulus W.	80 4 31	2366	81 48 55	2369	83 33 14	2373	85 17 27	2378
	Saturn W.	68 54 8	2371	70 38 25	2374	72 22 37	2378	74 6 43	2382
	Spica W.	26 5 43	2391	27 49 31	2391	29 33 18	2393	31 17 3	2394
	SUN E.	58 27 1	2666	56 50 2	2669	55 13 8	2664	53 36 20	2669
7	Jupiter W.	95 55 19	2379	97 39 24	2384	99 23 22	2389	101 7 12	2396
	Regulus W.	93 56 52	2402	95 40 24	2406	97 23 48	2413	99 7 4	2419
	Saturn W.	82 45 45	2404	84 29 14	2410	86 12 35	2415	87 55 49	2421
	Spica W.	39 54 58	2410	41 38 18	2416	43 21 32	2419	45 4 40	2424
	SUN E.	45 34 0	2726	43 57 53	2731	42 21 54	2738	40 46 4	2743
8	Saturn W.	96 29 49	2452	98 12 10	2459	99 54 21	2467	101 36 21	2474
	Spica W.	53 38 24	2453	55 20 44	2460	57 2 54	2466	58 44 55	2473
	SUN E.	32 48 58	2777	31 14 0	2785	29 39 12	2792	28 4 34	2801
13	SUN W.	27 44 18	2314	29 10 10	2327	30 35 47	2339	32 1 10	2361
	α Arietis E.	74 31 25	2693	72 58 18	2674	71 25 26	2666	69 52 49	2697

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Day.	XVh.	P. L. of Day.	XVIIIh.	P. L. of Day.	XXIh.	P. L. of Day.
1	Pollux W.	53° 56' 0"	2331	55° 41' 14"	2329	57° 26' 31"	2328	59° 11' 50"	2326
	Spica E.	37 39 48	2300	35 54 2	2311	34 8 18	2312	32 22 36	2313
	Antares E.	83 17 16	2380	81 31 1	2380	79 44 46	2389	77 58 30	2389
	Venus E.	85 59 55	2702	84 23 18	2701	82 46 40	2701	81 10 1	2701
	SUN E.	117 19 42	2613	115 41 5	2613	114 2 28	2613	112 23 50	2612
2	Pollux W.	67 58 49	2328	69 44 15	2324	71 29 40	2324	73 15 5	2324
	Jupiter W.	32 37 26	2303	34 23 21	2301	36 9 19	2299	37 55 20	2298
	Regulus W.	30 56 56	2320	32 42 27	2318	34 28 0	2317	36 13 35	2316
	Spica E.	23 35 14	2338	21 50 10	2347	20 5 19	2346	18 20 44	2373
	Antares E.	69 7 18	2291	67 21 6	2292	65 34 55	2294	63 48 46	2294
	Venus E.	73 6 50	2703	71 30 14	2704	69 53 40	2703	68 17 7	2707
	SUN E.	104 10 44	2615	102 32 9	2615	100 53 35	2616	99 15 2	2618
3	Pollux W.	82 1 53	2329	83 47 10	2331	85 32 24	2333	87 17 35	2335
	Jupiter W.	46 45 36	2298	48 31 39	2296	50 17 41	2299	52 3 42	2300
	Regulus W.	45 1 37	2317	46 47 12	2317	48 32 46	2319	50 18 18	2320
	Saturn W.	33 59 39	2357	35 44 16	2353	37 28 58	2350	39 13 44	2348
	Antares E.	54 58 27	2302	53 12 30	2303	51 26 35	2305	49 40 43	2306
	Venus E.	60 14 56	2715	58 38 38	2719	57 2 23	2722	55 26 12	2724
	SUN E.	91 2 46	2620	89 24 26	2627	87 46 8	2629	86 7 53	2631
4	Pollux W.	96 2 46	2347	97 47 37	2349	99 32 25	2353	101 17 8	2356
	Jupiter W.	60 53 15	2309	62 39 2	2311	64 24 46	2313	66 10 27	2315
	Regulus W.	59 5 25	2329	60 50 42	2331	62 35 56	2334	64 21 6	2336
	Saturn W.	47 58 4	2346	49 42 57	2347	51 27 48	2348	53 12 38	2349
	Antares E.	40 52 14	2320	39 6 43	2322	37 21 16	2326	35 35 53	2326
	Venus E.	47 26 13	2741	45 50 27	2744	44 14 46	2746	42 39 10	2753
	SUN E.	77 57 23	2644	76 19 28	2646	74 41 36	2649	73 3 48	2652
5	Jupiter W.	74 57 55	2329	76 43 12	2333	78 28 24	2336	80 13 32	2339
	Regulus W.	73 5 59	2351	74 50 44	2354	76 35 25	2357	78 20 1	2362
	Saturn W.	61 56 15	2358	63 40 50	2362	65 25 20	2364	67 9 46	2367
	Antares E.	26 50 4	2344	25 5 9	2348	23 20 20	2353	21 35 37	2357
	Venus E.	34 42 51	2781	33 7 58	2786	31 33 15	2796	29 58 42	2806
	SUN E.	64 55 54	2609	63 18 33	2673	61 41 17	2677	60 4 6	2681
6	Jupiter W.	88 57 47	2359	90 42 20	2364	92 26 47	2368	94 11 7	2374
	Regulus W.	87 1 33	2382	88 45 33	2387	90 29 26	2391	92 13 13	2397
	Saturn W.	75 50 44	2386	77 34 39	2391	79 18 27	2396	81 2 9	2399
	Spica W.	33 0 46	2396	34 44 26	2400	36 28 1	2403	38 11 32	2406
	SUN E.	51 59 39	2704	50 23 4	2709	48 46 36	2713	47 10 14	2719
7	Jupiter W.	102 50 53	2401	104 34 26	2408	106 17 50	2414	108 1 5	2420
	Regulus W.	100 50 12	2425	102 33 11	2431	104 16 1	2438	105 58 42	2445
	Saturn W.	89 38 54	2426	91 21 51	2433	93 4 39	2438	94 47 19	2445
	Spica W.	46 47 41	2429	48 30 34	2435	50 13 19	2441	51 55 56	2447
	SUN E.	39 10 21	2750	37 34 47	2756	35 59 22	2763	34 24 5	2770
8	Saturn W.	103 18 11	2432	104 59 50	2439	106 41 18	2448	108 22 34	2457
	Spica W.	60 26 46	2480	62 8 27	2487	63 49 58	2495	65 31 18	2503
	SUN E.	26 30 7	2808	24 55 50	2817	23 21 44	2826	21 47 49	2834
13	SUN W.	33 26 19	2363	34 51 14	2374	36 15 56	2386	37 40 24	2396
	α Arietis E.	68 20 26	2909	66 48 18	2919	65 16 23	2930	63 44 42	2941

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
14	SUN	W.	39° 4' 40"	3307	40° 28' 43"	3319	41° 52' 33"	3329	43° 16' 11"	3339
	α Arietis	E.	62 13 15	3361	60 42 1	3392	59 11 0	3373	57 40 12	3361
	Aldebaran	E.	94 49 7	3366	93 18 39	3397	91 48 23	3307	90 18 19	3316
15	SUN	W.	50 11 32	3386	51 34 5	3393	52 56 29	3401	54 18 44	3409
	α Arietis	E.	50 9 15	3390	48 39 39	3398	47 10 13	3347	45 40 58	3356
	Aldebaran	E.	82 50 46	3390	81 21 47	3398	79 52 58	3376	78 24 19	3383
16	SUN	W.	61 8 0	3440	62 29 31	3445	63 50 57	3450	65 12 17	3454
	Fomalhaut	W.	36 1 54	4476	37 6 7	4385	38 11 42	4303	39 18 32	4230
	α Arietis	E.	38 17 14	3394	36 48 57	3192	35 20 50	3110	33 52 52	3117
	Aldebaran	E.	71 3 13	3116	69 35 23	3132	68 7 40	3128	66 40 4	3133
17	SUN	W.	71 58 2	3465	73 19 4	3468	74 40 4	3468	76 1 4	3467
	Fomalhaut	W.	45 7 57	3355	46 20 21	3314	47 33 27	3375	48 47 12	3340
	Aldebaran	E.	59 23 29	3164	57 56 25	3166	56 29 25	3161	55 2 29	3163
	Pollux	E.	101 14 0	3106	99 45 58	3106	98 17 56	3107	96 49 55	3106
18	SUN	W.	82 46 19	3460	84 7 28	3456	85 28 41	3453	86 49 58	3447
	Fomalhaut	W.	55 4 18	3394	56 21 11	3371	57 38 29	3348	58 56 12	3326
	α Pegasi	W.	32 8 15	3323	33 26 25	3378	34 45 23	3338	36 5 5	3301
	Aldebaran	E.	47 48 38	3177	46 22 1	3178	44 55 26	3181	43 28 54	3183
	Pollux	E.	89 29 32	3090	88 1 21	3096	86 33 6	3092	85 4 47	3088
19	SUN	W.	93 37 52	3417	94 59 49	3410	96 21 54	3402	97 44 8	3393
	Fomalhaut	W.	65 30 25	3397	66 50 19	3369	68 10 33	3393	69 31 6	3375
	α Pegasi	W.	42 52 47	3367	44 15 53	3333	45 39 27	3310	47 3 27	3288
	Mars	W.	23 37 2	3397	24 59 22	3379	26 22 3	3361	27 45 4	3345
	Aldebaran	E.	36 17 8	3398	34 51 2	3390	33 25 4	3317	31 59 15	3325
	Pollux	E.	77 41 48	3062	76 12 52	3066	74 43 48	3048	73 14 35	3041
	Jupiter	E.	111 29 41	3004	109 59 33	2997	108 29 16	2999	106 58 49	2981
20	SUN	W.	104 37 58	3343	106 1 20	3333	107 24 55	3319	108 48 44	3306
	Fomalhaut	W.	76 18 32	3394	77 40 55	3379	79 3 36	3363	80 26 35	3347
	α Pegasi	W.	54 9 34	3188	55 35 57	3170	57 2 42	3152	58 29 49	3133
	Mars	W.	34 44 37	3379	36 9 23	3355	37 34 27	3341	38 59 48	3326
	Pollux	E.	65 46 3	2998	64 15 48	2999	62 45 21	2978	61 14 41	2967
	Jupiter	E.	99 23 53	2934	97 52 17	2924	96 20 28	2912	94 48 24	2901
	Regulus	E.	102 38 11	2973	101 7 24	2963	99 36 23	2960	98 5 7	2939
21	SUN	W.	115 51 36	3298	117 17 0	3234	118 42 41	3209	120 8 40	3193
	Fomalhaut	W.	87 25 51	3375	88 50 32	3390	90 15 30	3347	91 40 44	3323
	α Pegasi	W.	65 50 52	3044	67 20 10	3037	68 49 49	3009	70 19 50	2992
	Mars	W.	46 11 4	3148	47 38 15	3133	49 5 45	3116	50 33 35	3101
	Pollux	E.	53 37 56	2912	52 5 52	2901	50 33 34	2889	49 1 1	2876
	Jupiter	E.	87 4 17	2898	85 30 38	2895	83 56 42	2811	82 22 28	2796
	Regulus	E.	90 25 3	2876	88 52 13	2862	87 19 5	2848	85 45 40	2834
	Saturn	E.	100 57 35	2869	99 24 37	2855	97 51 21	2843	96 17 47	2836
22	α Pegasi	W.	77 55 23	2905	79 27 35	2887	81 0 10	2870	82 33 7	2853
	Mars	W.	57 57 45	3016	59 27 38	2999	60 57 52	2981	62 28 28	2964
	Pollux	E.	41 14 24	2818	39 40 20	2807	38 6 1	2797	36 31 29	2787
	Jupiter	E.	74 26 32	2722	72 50 22	2707	71 13 51	2693	69 37 0	2675
	Regulus	E.	77 53 50	2760	76 18 29	2744	74 42 47	2739	73 6 45	2712
	Saturn	E.	88 25 14	2762	86 49 43	2737	85 13 52	2721	83 37 40	2705

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
14	SUN W.	44° 39' 37"	3369	46° 2' 52"	3388	47° 25' 56"	3398	48° 48' 49"	3377
	α Arietis E.	56 9 36	3093	54 39 13	3001	53 9 2	3011	51 39 3	3030
	Aldebaran E.	88 48 26	3035	87 18 44	3034	85 49 14	3043	84 19 55	3052
15	SUN W.	55 40 50	3416	57 2 48	3433	58 24 39	3439	59 46 23	3435
	α Arietis E.	44 11 54	3064	42 43 0	3071	41 14 15	3079	39 45 40	3087
	Aldebaran E.	76 55 49	3061	75 27 28	3067	73 59 15	3104	72 31 10	3110
16	SUN W.	66 38 33	3487	67 54 45	3461	69 15 53	3463	70 36 58	3464
	Fomalhaut W.	40 26 30	4163	41 35 31	4106	42 45 28	4060	43 56 18	4001
	α Arietis E.	32 25 3	3126	30 57 24	3123	29 29 53	3140	28 2 32	3142
	Aldebaran E.	65 12 34	3128	63 45 10	3143	62 17 51	3147	60 50 38	3150
17	SUN W.	77 22 5	3497	78 43 6	3465	80 4 9	3464	81 25 13	3463
	Fomalhaut W.	50 1 33	3907	51 16 28	3776	52 31 55	3747	53 47 52	3730
	Aldebaran E.	53 35 36	3167	52 8 47	3169	50 42 1	3172	49 15 18	3174
	Pollux E.	95 21 53	3105	93 53 50	3105	92 25 46	3108	90 57 40	3101
18	SUN W.	88 11 21	3443	89 32 49	3426	90 54 23	3433	92 16 3	3434
	Fomalhaut W.	60 14 18	3905	61 32 47	3664	62 51 39	3665	64 10 52	3646
	α Pegasi E.	37 25 28	3498	38 46 28	3487	40 8 3	3498	41 30 10	3392
	Aldebaran E.	42 2 25	3187	40 36 0	3189	39 9 38	3193	37 43 20	3198
	Pollux E.	83 36 23	3098	82 7 53	3079	80 39 18	3074	79 10 37	3068
19	SUN W.	99 6 32	3965	100 29 6	3374	101 51 52	3365	103 14 49	3354
	Fomalhaut W.	70 51 58	3496	72 13 9	3441	73 34 39	3435	74 56 27	3410
	α Pegasi W.	48 27 52	3367	49 52 42	3347	51 17 56	3336	52 43 34	3308
	Mars W.	29 8 23	3330	30 32 0	3314	31 55 55	3299	33 20 8	3285
	Aldebaran E.	30 33 36	3237	29 8 11	3263	27 43 4	3270	26 18 18	3294
	Pollux E.	71 45 13	3088	70 15 41	3025	68 45 59	3017	67 16 7	3007
	Jupiter E.	105 28 13	2973	103 57 26	2963	102 26 27	2954	100 55 16	2944
20	SUN W.	110 12 48	3994	111 37 6	3361	113 1 40	3367	114 26 30	3253
	Fomalhaut W.	81 49 52	3323	83 13 27	3318	84 37 18	3305	86 1 26	3288
	α Pegasi W.	59 57 18	3115	61 25 9	3097	62 53 22	3080	64 21 56	3062
	Mars W.	40 25 27	3210	41 51 24	3196	43 17 39	3180	44 44 12	3164
	Pollux E.	59 43 47	3067	58 12 40	3048	56 41 19	3035	55 9 45	2924
	Jupiter E.	93 16 6	2969	91 43 33	2976	90 10 44	2964	88 37 39	2951
	Regulus E.	96 33 37	2927	95 1 52	2915	93 29 52	2902	91 57 36	2889
21	SUN W.	121 34 58	3178	123 1 34	3161	124 28 30	3145	125 55 45	3129
	Fomalhaut W.	93 6 15	3219	94 32 2	3208	95 58 4	3194	97 24 20	3182
	α Pegasi W.	71 50 13	2975	73 20 57	2967	74 52 4	2959	76 23 33	2923
	Mars W.	52 1 44	3064	53 30 13	3067	54 59 3	3051	56 28 13	3033
	Pollux E.	47 28 12	2965	45 55 8	2963	44 21 49	2941	42 48 14	2929
	Jupiter E.	80 47 55	2782	79 13 4	2767	77 37 53	2752	76 2 22	2738
	Regulus E.	84 11 56	2930	82 37 54	2908	81 3 32	2790	79 28 51	2775
	Saturn E.	94 43 55	2913	93 9 44	2798	91 35 14	2783	90 0 24	2768
22	α Pegasi W.	84 6 26	2936	85 40 7	2920	87 14 9	2903	88 48 33	2766
	Mars W.	63 59 26	2946	65 30 46	2929	67 2 28	2911	68 34 33	2903
	Pollux E.	34 56 44	2779	33 21 48	2770	31 46 41	2763	30 11 24	2756
	Jupiter E.	67 59 47	2960	66 22 13	2944	64 44 18	2928	63 6 1	2912
	Regulus E.	71 30 21	2908	69 53 36	2891	68 16 30	2884	66 39 2	2848
	Saturn E.	82 1 7	2939	80 24 13	2973	78 46 57	2957	77 9 20	2941

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
23	α Pegasi W.	90° 23' 19"	2770	91° 58' 26"	2768	93° 33' 55"	2738	95° 9' 45"	2723
	Mars W.	70 7 1	2876	71 39 51	2866	73 13 4	2840	74 46 40	2822
	α Arietis W.	47 24 10	2648	49 1 58	2632	50 40 10	2614	52 18 46	2597
	Jupiter E.	61 27 22	2606	59 48 21	2589	58 8 59	2564	56 29 15	2548
	Regulus E.	65 1 12	2632	63 23 1	2616	61 44 27	2599	60 5 31	2584
	Saturn E.	75 31 21	2626	73 53 1	2609	72 14 18	2593	70 35 13	2577
24	Mars W.	82 40 23	2735	84 16 16	2719	85 52 31	2703	87 29 8	2686
	α Arietis W.	60 37 41	2611	62 18 39	2604	64 0 0	2579	65 41 43	2562
	Aldebaran W.	29 6 56	2726	30 43 1	2699	32 19 56	2654	33 57 38	2631
	Jupiter E.	48 5 8	2471	46 23 14	2456	44 40 59	2442	42 58 24	2426
	Regulus E.	51 45 24	2604	50 4 17	2499	48 22 49	2475	46 41 0	2460
	Saturn E.	62 14 24	2499	60 33 9	2485	58 51 34	2470	57 9 39	2455
	Spica E.	105 47 46	2499	104 6 31	2482	102 24 53	2467	100 42 53	2453
25	Mars W.	95 37 35	2609	97 16 18	2594	98 55 21	2580	100 34 44	2566
	α Arietis W.	74 15 50	2287	75 59 44	2273	77 43 58	2259	79 28 31	2246
	Aldebaran W.	42 16 4	2493	43 57 27	2471	45 39 21	2451	47 21 43	2432
	Saturn E.	48 35 8	2690	46 51 19	2678	45 7 13	2667	43 22 51	2647
	Spica E.	92 7 32	2278	90 23 25	2264	88 38 58	2250	86 54 11	2237
26	α Arietis W.	88 15 55	2285	90 2 16	2270	91 48 52	2255	93 35 43	2243
	Aldebaran W.	55 59 53	2260	57 44 39	2237	59 29 45	2224	61 15 10	2212
	Saturn E.	34 37 44	2220	32 52 14	2216	31 6 38	2214	29 20 59	2212
	Spica E.	78 5 45	2278	76 19 13	2267	74 32 25	2257	72 45 22	2247
27	Aldebaran W.	70 6 18	2262	71 53 14	2254	73 40 21	2247	75 27 39	2239
	Pollux W.	28 10 26	2231	29 55 55	2201	31 41 53	2205	33 28 15	2270
	Spica E.	63 46 51	2208	61 58 35	2201	60 10 9	2196	58 21 34	2190
28	Aldebaran W.	84 26 19	2216	86 14 22	2214	88 2 28	2212	89 50 37	2211
	Pollux W.	42 24 37	2221	44 12 33	2214	46 0 39	2209	47 48 53	2206
	Spica E.	49 17 2	2173	47 27 54	2172	45 38 44	2170	43 49 32	2170
	Antares E.	94 56 50	2161	93 7 23	2159	91 17 53	2157	89 28 21	2156
29	Pollux W.	56 51 13	2196	58 39 48	2196	60 28 22	2194	62 16 55	2188
	Jupiter W.	24 8 23	2170	25 57 36	2167	27 46 53	2165	29 36 14	2162
	Spica E.	34 43 41	2178	32 54 41	2182	31 5 46	2182	29 16 59	2182
	Antares E.	80 20 24	2157	78 30 51	2156	76 41 20	2160	74 51 52	2162
30	Pollux W.	71 18 55	2211	73 7 6	2216	74 55 10	2220	76 43 7	2226
	Jupiter W.	38 43 16	2166	40 32 35	2169	42 21 49	2172	44 10 57	2177
	Regulus W.	34 17 10	2206	36 5 30	2208	37 53 46	2211	39 41 57	2215
	Saturn W.	24 41 27	2274	26 28 5	2266	28 14 54	2260	30 1 52	2256
	Antares E.	65 45 44	2181	63 56 48	2186	62 8 0	2191	60 19 19	2197
	Venus E.	103 38 12	2267	101 58 32	2272	100 18 59	2278	98 39 34	2263
	SUN E.	128 40 34	2496	126 59 15	2492	125 18 4	2497	123 37 0	2513
31	Pollux W.	85 40 46	2256	87 27 50	2264	89 14 43	2271	91 1 25	2279
	Jupiter W.	53 14 51	2204	55 3 12	2210	56 51 24	2217	58 39 26	2226
	Regulus W.	48 41 7	2242	50 28 32	2249	52 15 47	2256	54 2 52	2262
	Saturn W.	38 57 22	2260	40 44 22	2262	42 31 17	2266	44 18 6	2271
	Antares E.	51 18 10	2239	49 30 25	2236	47 42 51	2244	45 55 29	2251
	Venus E.	90 24 38	2218	88 46 8	2226	87 7 49	2235	85 29 41	2243
	SUN E.	115 13 54	2247	113 33 46	2255	111 53 49	2263	110 14 3	2271

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	α Pegasi W.	96° 45' 55"	2707	98° 22' 25"	2692	99° 59' 16"	2678	101° 36' 26"	2663
	Mars W.	76 20 39	2606	77 55 1	2787	79 29 46	2770	81 4 53	2753
	α Arietis W.	53 57 45	2680	55 37 8	2692	57 16 55	2646	58 57 6	2627
	Jupiter E.	54 49 9	2633	53 8 41	2617	51 27 52	2602	49 46 41	2486
	Regulus E.	58 26 14	2668	56 46 35	2651	55 6 33	2636	53 26 9	2620
	Saturn E.	68 55 47	2661	67 15 59	2645	65 35 49	2630	63 55 17	2616
24	Mars W.	89 6 7	2670	90 43 27	2654	92 21 9	2638	93 59 12	2624
	α Arietis W.	67 23 49	2447	69 6 17	2483	70 49 6	2417	72 32 17	2401
	Aldebaran W.	35 36 4	2692	37 15 10	2646	38 54 53	2639	40 35 12	2616
	Jupiter E.	41 15 29	2416	39 32 15	2401	37 48 42	2386	36 4 50	2376
	Regulus E.	44 58 51	2446	43 16 22	2433	41 33 33	2418	39 50 24	2405
	Saturn E.	55 27 23	2441	53 44 47	2439	52 1 53	2416	50 18 40	2403
	Spica E.	99 0 32	2436	97 17 49	2421	95 34 44	2406	93 51 18	2392
25	Mars W.	102 14 26	2653	103 54 26	2640	105 34 43	2627	107 15 18	2616
	α Arietis W.	81 13 23	2633	82 58 34	2620	84 44 4	2609	86 29 51	2597
	Aldebaran W.	49 4 32	2414	50 47 47	2397	52 31 26	2361	54 15 28	2366
	Saturn E.	41 38 14	2446	39 53 24	2329	38 8 21	2331	36 23 7	2326
	Spica E.	85 9 6	2324	83 23 42	2312	81 38 0	2300	79 52 1	2289
26	α Arietis W.	95 22 49	2346	97 10 8	2236	96 57 39	2230	100 45 22	2223
	Aldebaran W.	63 0 52	2300	64 46 51	2299	66 33 6	2280	68 19 35	2270
	Saturn E.	27 35 19	2316	25 49 42	2320	24 4 12	2328	22 18 53	2337
	Spica E.	70 58 5	2339	69 10 35	2330	67 22 52	2323	65 34 57	2314
27	Aldebaran W.	77 15 8	2333	79 2 46	2329	80 50 31	2326	82 38 22	2320
	Pollux W.	35 14 58	2336	37 2 0	2346	38 49 19	2337	40 36 52	2329
	Spica E.	56 32 51	2186	54 44 2	2182	52 55 7	2178	51 6 7	2176
28	Aldebaran W.	91 38 48	2310	93 27 0	2210	95 15 12	2210	97 3 24	2212
	Pollux W.	49 37 13	2302	51 25 38	2199	53 14 7	2197	55 2 39	2196
	Spica E.	42 0 19	2170	40 11 6	2171	38 21 55	2173	36 32 46	2176
	Antares E.	87 38 47	2156	85 49 11	2155	83 59 35	2156	82 9 59	2156
29	Pollux W.	64 5 26	2300	65 53 54	2302	67 42 18	2304	69 30 39	2306
	Jupiter W.	31 25 38	2162	33 15 3	2161	35 4 29	2162	36 53 54	2164
	Spica E.	27 28 20	2199	25 39 51	2196	23 51 35	2118	22 3 34	2229
	Antares E.	73 2 28	2166	71 13 9	2169	69 23 55	2172	67 34 46	2177
30	Pollux W.	78 30 56	2281	80 18 37	2287	82 6 9	2243	83 53 32	2249
	Jupiter W.	45 59 59	2182	47 48 54	2187	49 37 41	2193	51 26 20	2196
	Regulus W.	41 30 2	2220	43 18 0	2225	45 5 51	2231	46 53 33	2236
	Saturn W.	31 48 56	2254	33 36 3	2253	35 23 11	2264	37 10 18	2266
	Antares E.	58 30 47	2303	56 42 23	2309	54 54 9	2316	53 6 5	2322
	Venus E.	97 0 16	2690	95 21 7	2697	93 42 8	2694	92 3 18	2611
	Sun E.	121 56 5	2619	120 15 18	2626	118 34 40	2633	116 54 12	2640
31	Pollux W.	92 47 56	2286	94 34 16	2284	96 20 24	2263	98 6 19	2311
	Jupiter W.	60 27 17	2231	62 14 58	2239	64 2 28	2246	65 49 47	2256
	Regulus W.	55 49 47	2270	57 36 31	2277	59 23 4	2285	61 9 26	2292
	Saturn W.	46 4 48	2276	47 51 23	2282	49 37 49	2286	51 24 6	2296
	Antares E.	44 8 18	2339	42 21 18	2367	40 34 30	2376	38 47 54	2383
	Venus E.	83 51 44	2661	82 13 58	2660	80 36 24	2669	78 59 2	2678
	Sun E.	108 34 28	2660	106 55 5	2666	105 15 53	2666	103 36 52	2666

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Fri.	1	^h 21 ^m 0 ^s 39.12	10.175	S. 17° 0' 46".1	42.94	16 15.93	68.24	^m 13 ^s 54.75	0.318	
Sat.	2	21 4 42.93	10.142	16 43 26.4	43.68	16 15.77	68.13	14 1.98	0.284	
Sun.	3	21 8 45.94	10.108	16 25 49.2	44.40	16 15.61	68.01	14 8.41	0.251	
Mon.	4	21 12 48.14	10.075	16 7 54.7	45.10	16 15.45	67.89	14 14.04	0.218	
Tues.	5	21 16 49.54	10.041	15 49 43.5	45.79	16 15.28	67.77	14 18.89	0.184	
Wed.	6	21 20 50.13	10.008	15 31 16.1	46.46	16 15.10	67.65	14 22.90	0.151	
Thur.	7	21 24 49.94	9.975	15 12 32.8	47.11	16 14.92	67.54	15 26.14	0.118	
Fri.	8	21 28 48.96	9.942	14 53 34.0	47.75	16 14.75	67.43	14 28.60	0.085	
Sat.	9	21 32 47.18	9.910	14 34 20.2	48.37	16 14.56	67.32	14 30.25	0.052	
Sun.	10	21 36 44.62	9.877	14 14 51.7	48.97	16 14.37	67.21	14 31.14	0.020	
Mon.	11	21 40 41.27	9.844	13 55 9.2	49.56	16 14.18	67.10	14 31.23	0.012	
Tues.	12	21 44 37.15	9.813	13 35 12.9	50.12	16 13.99	66.99	14 30.56	0.044	
Wed.	13	21 48 32.27	9.781	13 15 3.4	50.66	16 13.80	66.88	14 29.12	0.075	
Thur.	14	21 52 26.62	9.750	12 54 41.2	51.18	16 13.61	66.77	14 26.93	0.106	
Fri.	15	21 56 20.22	9.719	12 34 6.5	51.69	16 13.41	66.66	14 24.00	0.137	
Sat.	16	22 0 13.07	9.688	12 13 19.8	52.18	16 13.21	66.56	14 20.31	0.168	
Sun.	17	22 4 5.18	9.657	11 52 21.6	52.65	16 13.00	66.46	14 15.88	0.198	
Mon.	18	22 7 56.58	9.628	11 31 12.4	53.11	16 12.79	66.36	14 10.73	0.237	
Tues.	19	22 11 47.30	9.600	11 9 52.5	53.55	16 12.58	66.26	14 4.91	0.266	
Wed.	20	22 15 37.35	9.572	10 48 22.2	53.97	16 12.36	66.17	13 58.42	0.284	
Thur.	21	22 19 26.73	9.544	10 26 42.0	54.37	16 12.14	66.08	13 51.26	0.312	
Fri.	22	22 23 15.43	9.517	10 4 52.4	54.76	16 11.92	65.99	13 43.42	0.339	
Sat.	23	22 27 3.49	9.490	9 42 53.8	55.13	16 11.70	65.90	13 34.95	0.366	
Sun.	24	22 30 50.92	9.464	9 20 46.3	55.49	16 11.47	65.81	13 25.86	0.392	
Mon.	25	22 34 37.73	9.439	8 58 30.3	55.84	16 11.23	65.73	13 16.14	0.416	
Tues.	26	22 38 23.97	9.416	8 36 6.3	56.16	16 10.99	65.65	13 5.86	0.439	
Wed.	27	22 42 9.66	9.394	8 13 34.7	56.47	16 10.75	65.57	12 55.03	0.461	
Thur.	28	22 45 54.83	9.373	7 50 55.8	56.77	16 10.51	65.49	12 43.68	0.483	
Fri.	29	22 49 39.49	9.352	S. 7 28 10.1	57.05	16 10.26	65.41	12 31.82	0.504	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Fri.	1	^h 21 ^m 0 ^s 36.76	10.175	S. 17° 0' 56.1"	42.94	^m 13 ^s 54.67	0.318	^h 20 ^m 46 ^s 42.09
Sat.	2	21 4 40.56	10.149	16 43 36.7	43.68	14 1.91	0.284	20 50 38.65
Sun.	3	21 8 43.56	10.108	16 25 59.7	44.40	14 8.35	0.251	20 54 35.21
Mon.	4	21 12 45.75	10.075	16 8 5.4	45.10	14 13.99	0.218	20 58 31.76
Tues.	5	21 16 47.14	10.041	15 49 54.4	45.79	14 18.83	0.184	21 2 28.31
Wed.	6	21 20 47.73	10.008	15 31 27.2	46.46	14 22.86	0.151	21 6 24.87
Thur.	7	21 24 47.54	9.975	15 12 44.1	47.11	14 26.11	0.118	21 10 21.43
Fri.	8	21 28 46.56	9.942	14 53 45.5	47.75	14 28.58	0.085	21 14 17.98
Sat.	9	21 32 44.78	9.910	14 34 31.9	48.37	14 30.24	0.052	21 18 14.54
Sun.	10	21 36 42.22	9.877	14 15 3.6	48.97	14 31.13	0.020	21 22 11.09
Mon.	11	21 40 38.88	9.844	13 55 21.2	49.56	14 31.23	0.012	21 26 7.65
Tues.	12	21 44 34.77	9.813	13 35 25.0	50.12	14 30.57	0.044	21 30 4.20
Wed.	13	21 48 29.90	9.781	13 15 15.6	50.66	14 29.14	0.075	21 34 0.76
Thur.	14	21 52 24.27	9.750	12 54 53.5	51.18	14 26.96	0.106	21 37 57.31
Fri.	15	21 56 17.89	9.719	12 34 18.9	51.69	14 24.03	0.137	21 41 53.86
Sat.	16	22 0 10.76	9.688	12 13 32.3	52.18	14 20.34	0.168	21 45 50.42
Sun.	17	22 4 2.89	9.657	11 52 34.2	52.65	14 15.92	0.198	21 49 46.97
Mon.	18	22 7 54.31	9.628	11 31 25.0	53.11	14 10.78	0.227	21 53 43.53
Tues.	19	22 11 45.05	9.600	11 10 5.1	53.55	14 4.97	0.256	21 57 40.08
Wed.	20	22 15 35.12	9.572	10 48 34.8	53.97	13 58.48	0.284	22 1 36.64
Thur.	21	22 19 24.52	9.544	10 26 54.6	54.37	13 51.33	0.312	22 5 33.19
Fri.	22	22 23 13.25	9.517	10 5 5.0	54.76	13 43.50	0.339	22 9 29.75
Sat.	23	22 27 1.34	9.490	9 43 6.3	55.13	13 35.04	0.366	22 13 26.30
Sun.	24	22 30 48.80	9.464	9 20 58.7	55.49	13 25.95	0.392	22 17 22.85
Mon.	25	22 34 35.64	9.439	8 58 42.6	55.84	13 16.23	0.416	22 21 19.41
Tues.	26	22 38 21.91	9.416	8 36 18.5	56.16	13 5.95	0.439	22 25 15.96
Wed.	27	22 42 7.63	9.394	8 13 46.8	56.47	12 55.12	0.461	22 29 12.51
Thur.	28	22 45 52.84	9.373	7 51 7.8	56.77	12 43.77	0.483	22 33 9.07
Fri.	29	22 49 37.54	9.352	S. 7 28 22.0	57.05	12 31.92	0.504	22 37 5.62

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.										
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.	
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.					
		λ	λ'							
1	32	312° 41' 23.9"	41' 2.2"	152.14	—0.81	9.9937502	29.2	^h 3 ^m 12 ^s 46.24		
2	33	313 42 14.5	41 52.7	152.10	0.78	.9938216	30.0	3 8 50.33		
3	34	314 43 4.2	42 42.3	152.06	0.72	.9938949	30.8	3 4 54.42		
4	35	315 43 58.1	43 31.1	152.02	0.63	.9939700	31.6	3 0 58.51		
5	36	316 44 41.0	44 18.8	151.98	0.53	.9940468	32.3	2 57 2.60		
6	37	317 45 27.8	45 5.4	151.94	0.41	.9941251	32.8	2 53 6.69		
7	38	318 46 13.5	45 51.0	151.89	0.28	.9942047	33.3	2 49 10.78		
8	39	319 46 58.1	46 35.5	151.84	0.14	.9942854	33.8	2 45 14.87		
9	40	320 47 41.5	47 18.8	151.78	—0.01	.9943671	34.3	2 41 18.96		
10	41	321 48 23.5	48 0.6	151.72	+0.11	.9944500	34.7	2 37 23.05		
11	42	322 49 4.2	48 41.1	151.66	0.22	.9945340	35.1	2 33 27.14		
12	43	323 49 43.3	49 20.1	151.59	0.30	.9946191	35.6	2 29 31.23		
13	44	324 50 20.7	49 57.4	151.52	0.35	.9947053	36.1	2 25 35.32		
14	45	325 50 56.5	50 33.1	151.45	0.37	.9947926	36.6	2 21 39.42		
15	46	326 51 30.5	51 6.9	151.38	0.36	.9948811	37.2	2 17 43.51		
16	47	327 52 2.7	51 39.0	151.31	0.31	.9949710	37.7	2 13 47.60		
17	48	328 52 33.1	52 9.3	151.23	0.24	.9950622	38.3	2 9 51.69		
18	49	329 53 1.6	52 37.7	151.15	0.15	.9951549	38.9	2 5 55.78		
19	50	330 53 28.2	53 4.2	151.07	+0.05	.9952491	39.5	2 1 59.88		
20	51	331 53 52.9	53 28.7	150.99	—0.08	.9953449	40.2	1 58 3.97		
21	52	332 54 15.7	53 51.4	150.91	0.21	.9954425	41.0	1 54 8.06		
22	53	333 54 36.6	54 12.2	150.83	0.34	.9955420	41.8	1 50 12.15		
23	54	334 54 55.5	54 31.0	150.75	0.46	.9956433	42.6	1 46 16.24		
24	55	335 55 12.7	54 48.1	150.68	0.56	.9957464	43.3	1 42 20.34		
25	56	336 55 28.3	55 3.6	150.61	0.65	.9958513	44.1	1 38 24.43		
26	57	337 55 42.1	55 17.3	150.54	0.71	.9959581	44.8	1 34 28.52		
27	58	338 55 54.3	55 29.4	150.47	0.75	.9960667	45.5	1 30 32.61		
28	59	339 56 4.8	55 39.8	150.40	0.75	.9961769	46.2	1 26 36.70		
29	60	340 56 13.7	55 48.6	150.34	—0.72	9.9962886	46.8	1 22 40.80		

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 11.4	16' 7.7	59' 18.5	-1.08	59' 4.9	-1.15	17 ^h 38.4 ^m	2.29	21.4 ^d
2	16 3.8	15 59.7	58 50.6	1.21	58 35.7	1.25	18 34.5	2.37	22.4
3	15 55.6	15 51.4	58 20.5	1.27	58 5.1	1.28	19 32.2	2.41	23.4
4	15 47.2	15 43.0	57 49.7	1.28	57 34.3	1.28	20 30.1	2.38	24.4
5	15 38.8	15 34.7	57 19.0	1.27	57 3.8	1.26	21 26.5	2.29	25.4
6	15 30.6	15 26.6	56 48.8	1.25	56 34.0	1.23	22 20.0	2.16	26.4
7	15 22.6	15 18.7	56 19.3	1.21	56 4.9	1.19	23 10.0	2.01	27.4
8	15 14.8	15 11.1	55 50.8	1.16	55 37.0	1.13	23 56.6	1.88	28.4
9	15 7.5	15 4.0	55 23.7	1.09	55 10.9	1.04	6		29.4
10	15 0.6	14 57.5	54 58.7	0.98	54 47.3	0.91	0 40.3	1.78	0.7
11	14 54.7	14 52.2	54 36.9	0.82	54 27.7	0.72	1 21.9	1.71	1.7
12	14 50.0	14 48.2	54 19.7	0.60	54 13.2	0.47	2 2.4	1.69	2.7
13	14 46.9	14 46.1	54 8.3	-0.32	54 5.2	-0.16	2 42.8	1.70	3.7
14	14 45.8	14 46.1	54 4.2	+0.01	54 5.4	+0.20	3 23.8	1.74	4.7
15	14 47.1	14 48.7	54 8.9	0.39	54 14.7	0.59	4 6.5	1.81	5.7
16	14 50.9	14 53.9	54 23.0	0.79	54 33.8	1.00	4 51.6	1.94	6.7
17	14 57.5	15 1.8	54 47.1	1.21	55 3.0	1.43	5 39.6	2.06	7.7
18	15 6.8	15 12.4	55 21.3	1.62	55 41.9	1.81	6 30.7	2.18	8.7
19	15 18.6	15 25.3	56 4.7	1.97	56 29.3	2.12	7 24.4	2.27	9.7
20	15 32.4	15 39.9	56 55.5	2.23	57 22.9	2.31	8 19.9	2.32	10.7
21	15 47.6	15 55.3	57 51.0	2.34	58 19.2	2.32	9 15.9	2.32	11.7
22	16 2.8	16 10.0	58 46.8	2.25	59 13.3	2.13	10 11.2	2.28	12.7
23	16 16.7	16 22.8	59 38.0	1.95	60 0.3	1.72	11 5.2	2.22	13.7
24	16 28.0	16 32.2	60 19.5	1.44	60 35.1	1.12	11 58.0	2.19	14.7
25	16 35.3	16 37.3	60 46.6	0.77	60 53.8	+0.40	12 50.1	2.17	15.7
26	16 38.1	16 37.6	60 56.6	+0.03	60 54.9	-0.33	13 42.4	2.20	16.7
27	16 36.0	16 33.3	60 48.9		60 39.1	0.97	14 35.8	2.26	17.7
28	16 29.7	16 25.3	60 25.8	-0.66	60 9.6	1.46	15 31.0	2.35	18.7
29	16 20.2	16 14.6	59 50.9	-1.63	59 30.4	-1.75	16 28.2	2.43	19.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	13 46 35.61	2.3187	8.16 34' 53.1"	12.229	0	15 41 32.51	2.4683	8.24 1' 13.3"	5.909
1	13 48 54.54	2.3171	16 47 4.3	12.135	1	15 44 0.50	2.4673	24 7 6.8	5.815
2	13 51 13.66	2.3206	16 59 9.2	12.029	2	15 46 28.61	2.4693	24 12 51.2	5.663
3	13 53 32.99	2.3220	17 11 7.7	11.923	3	15 48 56.83	2.4713	24 18 26.4	5.510
4	13 55 52.53	2.3273	17 22 59.7	11.813	4	15 51 25.16	2.4730	24 23 52.3	5.356
5	13 58 12.28	2.3308	17 34 45.2	11.708	5	15 53 53.60	2.4747	24 29 9.0	5.202
6	14 0 32.24	2.3343	17 46 24.1	11.603	6	15 56 22.14	2.4764	24 34 16.4	5.047
7	14 2 52.41	2.3379	17 57 56.3	11.481	7	15 58 50.78	2.4780	24 39 14.5	4.891
8	14 5 12.80	2.3415	18 9 21.8	11.368	8	16 1 19.51	2.4796	24 44 3.3	4.735
9	14 7 33.40	2.3451	18 20 40.4	11.253	9	16 3 48.33	2.4809	24 48 42.7	4.579
10	14 9 54.21	2.3487	18 31 52.1	11.137	10	16 6 17.23	2.4822	24 53 12.7	4.423
11	14 12 15.24	2.3523	18 42 56.8	11.020	11	16 8 46.21	2.4835	24 57 33.3	4.265
12	14 14 36.48	2.3557	18 53 54.5	10.903	12	16 11 15.26	2.4847	25 1 44.5	4.108
13	14 16 57.93	2.3592	19 4 45.1	10.783	13	16 13 44.37	2.4857	25 5 46.3	3.951
14	14 19 19.59	2.3627	19 15 28.5	10.663	14	16 16 13.54	2.4868	25 9 36.5	3.793
15	14 21 41.46	2.3662	19 26 4.6	10.543	15	16 18 42.76	2.4874	25 13 21.2	3.634
16	14 24 3.55	2.3696	19 36 33.4	10.419	16	16 21 12.03	2.4881	25 16 54.4	3.475
17	14 26 25.85	2.3733	19 46 54.8	10.295	17	16 23 41.34	2.4887	25 20 18.1	3.316
18	14 28 48.36	2.3768	19 57 8.7	10.170	18	16 26 10.68	2.4892	25 23 32.2	3.156
19	14 31 11.07	2.3802	20 7 15.1	10.044	19	16 28 40.05	2.4897	25 26 36.8	2.997
20	14 33 33.99	2.3836	20 17 13.9	9.918	20	16 31 9.44	2.4900	25 29 31.8	2.838
21	14 35 57.11	2.3870	20 27 5.1	9.790	21	16 33 38.85	2.4903	25 32 17.2	2.679
22	14 38 20.44	2.3906	20 36 48.6	9.660	22	16 36 8.27	2.4903	25 34 53.1	2.519
23	14 40 43.97	2.3939	8.20 46 24.3	9.530	23	16 38 37.69	2.4904	8.25 37 19.4	2.360
SATURDAY 2.					MONDAY 4.				
0	14 43 7.71	2.3973	8.20 55 52.1	9.398	0	16 41 7.11	2.4903	8.25 39 36.1	2.199
1	14 45 31.65	2.4007	21 5 12.0	9.265	1	16 43 36.52	2.4901	25 41 43.2	2.039
2	14 47 55.79	2.4040	21 14 23.9	9.131	2	16 46 5.92	2.4898	25 43 40.7	1.880
3	14 50 20.13	2.4073	21 23 27.7	8.997	3	16 48 35.99	2.4893	25 45 28.7	1.720
4	14 52 44.66	2.4106	21 32 23.4	8.863	4	16 51 4.63	2.4887	25 47 7.1	1.560
5	14 55 9.39	2.4137	21 41 11.0	8.736	5	16 53 33.93	2.4880	25 48 35.9	1.400
6	14 57 34.31	2.4169	21 49 50.4	8.608	6	16 56 3.19	2.4873	25 49 55.1	1.240
7	14 59 59.42	2.4201	21 58 21.4	8.449	7	16 58 32.41	2.4865	25 51 4.7	1.080
8	15 2 24.72	2.4232	22 6 44.1	8.309	8	17 1 1.57	2.4855	25 52 4.8	0.921
9	15 4 50.21	2.4263	22 14 58.4	8.169	9	17 3 30.67	2.4845	25 52 55.3	0.762
10	15 7 15.88	2.4293	22 23 4.3	8.028	10	17 5 59.70	2.4833	25 53 36.3	0.603
11	15 9 41.73	2.4323	22 31 1.8	7.887	11	17 8 28.66	2.4820	25 54 7.7	0.445
12	15 12 7.75	2.4351	22 38 50.8	7.745	12	17 10 57.53	2.4806	25 54 29.6	0.287
13	15 14 33.94	2.4379	22 46 31.2	7.601	13	17 13 26.32	2.4791	25 54 42.0	0.129
14	15 17 0.30	2.4407	22 54 2.9	7.456	14	17 15 55.01	2.4775	25 54 45.0	0.029
15	15 19 26.84	2.4435	23 1 25.8	7.310	15	17 18 23.61	2.4768	25 54 38.5	0.187
16	15 21 53.54	2.4462	23 8 40.0	7.164	16	17 20 52.10	2.4740	25 54 22.5	0.345
17	15 24 20.40	2.4488	23 15 45.4	7.017	17	17 23 20.48	2.4730	25 53 57.1	0.503
18	15 26 47.41	2.4514	23 22 41.9	6.870	18	17 25 48.74	2.4699	25 53 22.3	0.658
19	15 29 14.57	2.4539	23 29 29.6	6.722	19	17 28 16.87	2.4678	25 52 38.1	0.814
20	15 31 41.88	2.4563	23 36 8.4	6.573	20	17 30 44.87	2.4656	25 51 44.6	0.969
21	15 34 9.33	2.4587	23 42 38.2	6.423	21	17 33 12.73	2.4633	25 50 41.8	1.124
22	15 36 36.92	2.4610	23 48 59.0	6.272	22	17 35 40.45	2.4608	25 49 29.6	1.279
23	15 39 4.65	2.4632	23 55 10.7	6.121	23	17 38 8.02	2.4582	25 48 8.2	1.433
24	15 41 32.51	2.4653	8.24 1 13.3	5.969	24	17 40 35.43	2.4555	8.25 46 37.6	1.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	17 40 35.43	2.4495	S. 25° 46' 37.6"	1.667	0	19 33 49.28	2.2322	S. 21° 48' 10.9"	7.976
1	17 43 2.68	2.4497	25 44 57.8	1.740	1	19 36 3.46	2.2325	21 40 9.1	8.083
2	17 45 29.76	2.4498	25 43 8.8	1.803	2	19 38 17.30	2.2379	21 32 0.8	8.190
3	17 47 56.66	2.4499	25 41 10.6	1.845	3	19 40 30.81	2.2323	21 23 40.2	8.295
4	17 50 23.38	2.4499	25 39 3.3	1.197	4	19 42 43.98	2.2167	21 15 25.4	8.398
5	17 52 49.91	2.4497	25 36 46.9	1.248	5	19 44 56.81	2.2110	21 6 58.4	8.500
6	17 55 16.25	2.4475	25 34 21.6	1.497	6	19 47 9.30	2.2054	20 58 25.3	8.602
7	17 57 42.40	2.4442	25 31 47.3	1.645	7	19 49 21.45	2.1998	20 49 46.1	8.703
8	18 0 8.35	2.4398	25 29 4.1	1.793	8	19 51 33.27	2.1942	20 41 0.9	8.802
9	18 2 34.09	2.4373	25 26 12.0	1.941	9	19 53 44.75	2.1885	20 32 9.8	8.900
10	18 4 59.62	2.4397	25 23 11.0	2.088	10	19 55 55.88	2.1828	20 23 12.9	9.006
11	18 7 24.92	2.4300	25 20 1.3	2.234	11	19 58 6.67	2.1771	20 14 10.3	9.090
12	18 9 50.00	2.4192	25 16 42.8	2.380	12	20 0 17.13	2.1715	20 5 2.1	9.184
13	18 12 14.85	2.4128	25 13 15.6	2.526	13	20 2 27.25	2.1660	19 55 48.3	9.277
14	18 14 39.47	2.4053	25 9 39.7	2.689	14	20 4 37.03	2.1603	19 46 28.9	9.368
15	18 17 3.85	2.4043	25 5 55.2	2.812	15	20 6 46.48	2.1547	19 37 4.0	9.460
16	18 19 27.99	2.4008	25 2 2.1	2.955	16	20 8 55.59	2.1491	19 27 33.7	9.549
17	18 21 51.88	2.3952	24 58 0.5	4.097	17	20 11 4.36	2.1435	19 17 58.1	9.637
18	18 24 15.52	2.3919	24 53 50.4	4.238	18	20 13 12.80	2.1379	19 8 17.3	9.722
19	18 26 38.90	2.3876	24 49 31.9	4.377	19	20 15 20.90	2.1323	18 58 31.3	9.806
20	18 29 2.02	2.3832	24 45 5.1	4.515	20	20 17 28.67	2.1267	18 48 40.2	9.888
21	18 31 24.87	2.3787	24 40 30.0	4.652	21	20 19 36.10	2.1212	18 38 44.1	9.976
22	18 33 47.45	2.3743	24 35 46.7	4.789	22	20 21 43.20	2.1157	18 28 43.0	10.066
23	18 36 9.76	2.3698	S. 24 30 55.2	4.926	23	20 23 49.97	2.1102	S. 18 18 37.1	10.156
WEDNESDAY 6.					FRIDAY 8.				
0	18 38 31.79	2.3649	S. 24 25 55.6	5.060	0	20 25 56.41	2.1047	S. 18 8 26.4	10.217
1	18 40 53.54	2.3592	24 20 47.9	5.184	1	20 28 2.52	2.0993	17 58 11.0	10.295
2	18 43 15.01	2.3535	24 15 32.2	5.307	2	20 30 8.31	2.0939	17 47 50.9	10.373
3	18 45 36.19	2.3497	24 10 8.6	5.430	3	20 32 13.78	2.0885	17 37 26.1	10.450
4	18 47 57.08	2.3457	24 4 37.0	5.550	4	20 34 18.92	2.0831	17 26 56.8	10.525
5	18 50 17.67	2.3407	23 58 57.6	5.720	5	20 36 23.74	2.0777	17 16 23.1	10.599
6	18 52 37.96	2.3357	23 53 10.5	5.849	6	20 38 28.24	2.0734	17 5 45.0	10.671
7	18 54 57.95	2.3306	23 47 15.7	5.977	7	20 40 32.42	2.0671	16 55 2.6	10.742
8	18 57 17.63	2.3255	23 41 13.3	6.103	8	20 42 36.29	2.0619	16 44 16.0	10.812
9	18 59 37.00	2.3203	23 35 3.3	6.226	9	20 44 39.85	2.0567	16 33 25.2	10.881
10	19 1 56.06	2.3152	23 28 45.8	6.353	10	20 46 43.09	2.0515	16 22 30.3	10.949
11	19 4 14.81	2.3100	23 22 20.9	6.477	11	20 48 46.02	2.0463	16 11 31.3	11.016
12	19 6 33.26	2.3048	23 15 48.6	6.599	12	20 50 48.64	2.0419	16 0 28.4	11.081
13	19 8 51.89	2.3005	23 9 9.0	6.730	13	20 52 50.96	2.0362	15 49 21.6	11.146
14	19 11 9.19	2.3041	23 2 22.2	6.840	14	20 54 52.98	2.0312	15 38 11.0	11.208
15	19 13 26.67	2.3007	22 55 28.2	6.949	15	20 56 54.70	2.0262	15 26 56.7	11.270
16	19 15 43.83	2.3033	22 48 27.0	7.077	16	20 58 56.11	2.0212	15 15 38.6	11.332
17	19 18 0.66	2.3779	22 41 18.8	7.193	17	21 0 57.22	2.0162	15 4 16.9	11.392
18	19 20 17.17	2.3725	22 34 3.7	7.308	18	21 2 58.04	2.0113	14 52 51.6	11.450
19	19 22 33.85	2.3670	22 26 41.7	7.423	19	21 4 58.58	2.0065	14 41 22.8	11.507
20	19 24 49.30	2.3615	22 19 12.9	7.537	20	21 6 58.83	2.0017	14 29 50.7	11.563
21	19 27 4.72	2.3560	22 11 37.3	7.649	21	21 8 58.79	1.9970	14 18 15.2	11.618
22	19 29 19.91	2.3505	22 3 55.0	7.760	22	21 10 58.47	1.9923	14 6 36.4	11.673
23	19 31 34.76	2.3449	21 56 6.2	7.868	23	21 12 57.86	1.9876	13 54 54.3	11.727
24	19 33 49.28	2.3393	S. 21 48 10.9	7.976	24	21 14 56.97	1.9830	S. 13 43 9.1	11.779

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	^h 21 ^m 14 ^s 56.97	1.9830	S. 13° 43' 9.1"	11.779	0	^h 22 ^m 45 ^s 48.47	1.8247	S. 3° 37' 9.7"	13.100
1	21 16 55.81	1.9785	13 31 20.8	11.830	1	22 47 37.89	1.8229	3 24 3.0	13.114
2	21 18 54.38	1.9740	13 19 29.5	11.880	2	22 49 27.20	1.8210	3 10 56.0	13.119
3	21 20 52.68	1.9695	13 7 35.2	11.929	3	22 51 16.40	1.8192	2 57 48.7	13.123
4	21 22 50.71	1.9651	12 55 38.1	11.976	4	22 53 5.50	1.8175	2 44 41.2	13.126
5	21 24 48.48	1.9607	12 43 38.2	12.022	5	22 54 54.50	1.8159	2 31 38.5	13.129
6	21 26 45.99	1.9568	12 31 35.5	12.068	6	22 56 43.40	1.8143	2 18 25.7	13.130
7	21 28 43.24	1.9529	12 19 30.0	12.113	7	22 58 32.21	1.8128	2 5 17.8	13.132
8	21 30 40.23	1.9478	12 7 21.9	12.157	8	23 0 20.93	1.8114	1 52 9.8	13.133
9	21 32 36.97	1.9436	11 55 11.2	12.199	9	23 2 9.57	1.8101	1 39 1.8	13.135
10	21 34 33.46	1.9395	11 42 58.0	12.240	10	23 3 58.13	1.8088	1 25 53.9	13.136
11	21 36 29.71	1.9354	11 30 42.4	12.280	11	23 5 46.61	1.8076	1 12 46.1	13.138
12	21 38 25.71	1.9313	11 18 24.5	12.318	12	23 7 35.02	1.8063	0 59 38.5	13.139
13	21 40 21.47	1.9273	11 6 4.3	12.356	13	23 9 23.36	1.8052	0 46 31.1	13.140
14	21 42 17.00	1.9234	10 53 41.8	12.394	14	23 11 11.63	1.8041	0 33 23.9	13.141
15	21 44 12.30	1.9196	10 41 16.9	12.432	15	23 12 59.84	1.8030	0 20 17.0	13.142
16	21 46 7.36	1.9159	10 28 49.8	12.468	16	23 14 47.99	1.8020	S. 0 7 10.4	13.143
17	21 48 2.20	1.9122	10 16 20.6	12.502	17	23 16 36.09	1.8013	N. 0 5 55.8	13.144
18	21 49 56.82	1.9085	10 3 49.4	12.535	18	23 18 24.14	1.8004	0 19 1.5	13.145
19	21 51 51.21	1.9048	9 51 16.3	12.567	19	23 20 12.14	1.7996	0 32 6.8	13.146
20	21 53 45.38	1.9012	9 38 41.3	12.598	20	23 22 0.09	1.7989	0 45 11.7	13.147
21	21 55 39.34	1.8977	9 26 4.5	12.629	21	23 23 48.00	1.7983	0 58 16.0	13.148
22	21 57 33.09	1.8943	9 13 25.9	12.659	22	23 25 35.88	1.7978	1 11 19.7	13.149
23	21 59 26.64	1.8908	S. 9 0 45.5	12.687	23	23 27 23.73	1.7973	N. 1 24 22.8	13.150
SUNDAY 10.					TUESDAY 12.				
0	22 1 19.99	1.8876	S. 8 48 3.4	12.715	0	23 29 11.55	1.7968	N. 1 37 25.2	13.084
1	22 3 13.14	1.8843	8 35 19.7	12.742	1	23 30 59.34	1.7964	1 50 26.9	13.091
2	22 5 6.09	1.8810	8 22 34.4	12.768	2	23 32 47.11	1.7961	2 3 27.8	13.098
3	22 6 58.85	1.8778	8 9 47.6	12.793	3	23 34 34.86	1.7958	2 16 27.8	13.104
4	22 8 51.41	1.8746	7 56 59.3	12.817	4	23 36 22.60	1.7956	2 29 27.0	13.109
5	22 10 43.79	1.8716	7 44 9.6	12.840	5	23 38 10.33	1.7954	2 42 25.2	13.113
6	22 12 35.99	1.8685	7 31 18.5	12.862	6	23 39 58.05	1.7953	2 55 22.5	13.117
7	22 14 28.01	1.8655	7 18 26.2	12.882	7	23 41 45.77	1.7953	3 8 18.9	13.121
8	22 16 19.86	1.8627	7 5 32.7	12.902	8	23 43 33.48	1.7952	3 21 14.3	13.124
9	22 18 11.53	1.8598	6 52 38.0	12.921	9	23 45 21.20	1.7953	3 34 8.6	13.127
10	22 20 3.03	1.8570	6 39 42.1	12.940	10	23 47 8.93	1.7955	3 47 1.8	13.129
11	22 21 54.37	1.8543	6 26 45.1	12.958	11	23 48 56.67	1.7957	3 59 53.8	13.130
12	22 23 45.55	1.8517	6 13 47.1	12.975	12	23 50 44.42	1.7960	4 12 44.6	13.132
13	22 25 36.57	1.8492	6 0 48.1	12.991	13	23 52 32.19	1.7963	4 25 34.2	13.133
14	22 27 27.44	1.8467	5 47 48.2	13.006	14	23 54 19.99	1.7967	4 38 22.6	13.135
15	22 29 18.16	1.8443	5 34 47.4	13.020	15	23 56 7.81	1.7972	4 51 9.6	13.137
16	22 31 8.73	1.8417	5 21 45.8	13.033	16	23 57 55.66	1.7977	5 3 55.2	13.139
17	22 32 59.16	1.8393	5 8 43.4	13.045	17	23 59 43.54	1.7983	5 16 39.4	13.140
18	22 34 49.45	1.8370	4 55 40.3	13.056	18	0 1 31.46	1.7990	5 29 22.9	13.141
19	22 36 39.61	1.8348	4 42 36.6	13.067	19	0 3 19.42	1.7997	5 42 3.5	13.142
20	22 38 29.63	1.8326	4 29 32.3	13.077	20	0 5 7.43	1.8006	5 54 43.3	13.143
21	22 40 19.52	1.8305	4 16 27.4	13.086	21	0 6 55.49	1.8013	6 7 21.5	13.144
22	22 42 9.29	1.8285	4 3 21.9	13.094	22	0 8 43.59	1.8021	6 19 58.1	13.145
23	22 43 58.94	1.8266	3 50 16.0	13.102	23	0 10 31.74	1.8030	6 32 33.2	13.146
24	22 45 48.47	1.8247	S. 3 37 9.7	13.109	24	0 12 19.95	1.8040	N. 6 45 6.6	13.147

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s 0 12 19.95	1.8040	N. 6 45 6.6	12.542	0	h m s 1 41 10.43	1.9185	N. 16 1 21.6	10.369
1	0 14 8.23	1.8051	6 57 38.3	12.513	1	1 43 5.65	1.9222	16 11 41.9	10.307
2	0 15 56.57	1.8063	7 10 8.1	12.483	2	1 45 1.09	1.9268	16 21 58.4	10.243
3	0 17 44.98	1.8074	7 22 36.1	12.452	3	1 46 56.75	1.9286	16 32 11.0	10.179
4	0 19 33.46	1.8087	7 35 2.2	12.421	4	1 48 52.64	1.9338	16 42 19.7	10.113
5	0 21 22.02	1.8100	7 47 26.4	12.389	5	1 50 48.77	1.9373	16 52 24.5	10.047
6	0 23 10.66	1.8114	7 59 48.7	12.357	6	1 52 45.13	1.9412	17 2 25.3	9.980
7	0 24 59.39	1.8128	8 12 9.1	12.324	7	1 54 41.72	1.9452	17 12 22.0	9.912
8	0 26 48.20	1.8142	8 24 27.6	12.291	8	1 56 38.55	1.9492	17 22 14.7	9.844
9	0 28 37.10	1.8157	8 36 44.0	12.257	9	1 58 35.62	1.9532	17 32 3.3	9.776
10	0 30 26.10	1.8173	8 48 58.3	12.222	10	2 0 32.93	1.9572	17 41 47.8	9.707
11	0 32 15.19	1.8189	9 1 10.4	12.186	11	2 2 30.48	1.9612	17 51 28.1	9.637
12	0 34 4.38	1.8207	9 13 20.3	12.148	12	2 4 28.28	1.9653	18 1 4.1	9.565
13	0 35 53.67	1.8225	9 25 28.1	12.110	13	2 6 26.33	1.9696	18 10 35.8	9.493
14	0 37 43.07	1.8243	9 37 33.6	12.072	14	2 8 24.63	1.9737	18 20 3.2	9.420
15	0 39 32.58	1.8262	9 49 36.8	12.033	15	2 10 23.18	1.9779	18 29 26.2	9.347
16	0 41 22.21	1.8282	10 1 37.6	11.993	16	2 12 21.98	1.9822	18 38 44.8	9.273
17	0 43 11.96	1.8302	10 13 36.0	11.953	17	2 14 21.04	1.9865	18 47 58.9	9.198
18	0 45 1.83	1.8322	10 25 32.0	11.913	18	2 16 20.36	1.9908	18 57 8.4	9.121
19	0 46 51.82	1.8342	10 37 25.6	11.872	19	2 18 19.94	1.9952	19 6 13.3	9.044
20	0 48 41.94	1.8363	10 49 16.7	11.830	20	2 20 19.79	1.9996	19 15 13.6	8.966
21	0 50 32.19	1.8384	11 1 5.3	11.787	21	2 22 19.90	2.0040	19 24 9.2	8.888
22	0 52 22.58	1.8405	11 12 51.2	11.743	22	2 24 20.28	2.0085	19 33 0.1	8.809
23	0 54 13.10	1.8421	N. 11 24 34.5	11.699	23	2 26 20.93	2.0130	N. 19 41 46.2	8.729
THURSDAY 14.					SATURDAY 16.				
0	0 56 3.76	1.8455	N. 11 36 15.1	11.655	0	2 28 21.85	2.0176	N. 19 50 27.5	8.649
1	0 57 54.57	1.8480	11 47 53.0	11.610	1	2 30 23.04	2.0222	19 59 3.9	8.567
2	0 59 45.53	1.8505	11 59 28.2	11.564	2	2 32 24.51	2.0268	20 7 35.4	8.484
3	1 1 36.64	1.8531	12 11 0.6	11.517	3	2 34 26.26	2.0315	20 16 1.9	8.400
4	1 3 27.90	1.8557	12 22 30.2	11.470	4	2 36 28.29	2.0361	20 24 23.3	8.315
5	1 5 19.32	1.8583	12 33 56.9	11.422	5	2 38 30.59	2.0407	20 32 39.6	8.230
6	1 7 10.90	1.8610	12 45 20.7	11.372	6	2 40 33.17	2.0453	20 40 50.8	8.144
7	1 9 2.64	1.8637	12 56 41.5	11.322	7	2 42 36.03	2.0500	20 48 56.9	8.058
8	1 10 54.55	1.8665	13 7 59.4	11.272	8	2 44 39.18	2.0548	20 56 57.7	7.970
9	1 12 46.63	1.8695	13 19 14.2	11.222	9	2 46 42.61	2.0596	21 4 53.2	7.882
10	1 14 38.88	1.8725	13 30 25.9	11.170	10	2 48 46.33	2.0643	21 12 43.4	7.792
11	1 16 31.32	1.8755	13 41 34.5	11.117	11	2 50 50.33	2.0691	21 20 28.2	7.702
12	1 18 23.94	1.8785	13 52 39.9	11.064	12	2 52 54.62	2.0739	21 28 7.5	7.611
13	1 20 16.74	1.8815	14 3 42.1	11.010	13	2 54 59.20	2.0787	21 35 41.3	7.519
14	1 22 9.72	1.8846	14 14 41.0	10.955	14	2 57 4.07	2.0835	21 43 9.6	7.426
15	1 24 2.89	1.8878	14 25 36.6	10.900	15	2 59 9.23	2.0883	21 50 32.4	7.333
16	1 25 56.25	1.8910	14 36 28.9	10.844	16	3 1 14.68	2.0932	21 57 49.5	7.239
17	1 27 49.81	1.8943	14 47 17.8	10.787	17	3 3 20.42	2.0982	22 5 0.9	7.144
18	1 29 43.57	1.8976	14 58 3.3	10.730	18	3 5 26.46	2.1031	22 12 6.6	7.047
19	1 31 37.53	1.9010	15 8 45.3	10.673	19	3 7 32.80	2.1080	22 19 6.4	6.949
20	1 33 31.69	1.9044	15 19 23.8	10.613	20	3 9 39.43	2.1129	22 26 0.3	6.851
21	1 35 26.06	1.9078	15 29 58.7	10.552	21	3 11 46.35	2.1178	22 32 48.3	6.752
22	1 37 20.64	1.9113	15 40 30.0	10.492	22	3 13 53.57	2.1228	22 39 30.4	6.652
23	1 39 15.43	1.9149	15 50 57.7	10.431	23	3 16 1.09	2.1278	22 46 6.5	6.551
24	1 41 10.43	1.9185	N. 16 1 21.6	10.369	24	3 18 8.90	2.1327	N. 22 52 36.6	6.450

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	N. 22° 52'	"	0	h m s	s	N. 25° 48'	"
1	3 18 8.90	2.1897	52 36.6	6.460	1	5 5 52.60	2.3436	48 56.3	0.380
2	3 20 17.00	2.1876	22 59 0.5	6.348	2	5 8 13.26	2.3466	49 27.5	0.460
3	3 22 25.40	2.1485	23 5 18.3	6.344	3	5 10 34.11	2.3480	49 50.2	0.360
4	3 24 34.10	2.1474	23 11 29.8	6.140	4	5 12 55.14	2.3521	50 4.4	0.197
5	3 26 43.09	2.1523	23 17 35.0	6.035	5	5 15 16.36	2.3561	50 10.1	0.234
6	3 28 52.37	2.1572	23 23 33.9	5.929	6	5 17 37.76	2.3600	50 7.3	0.119
7	3 31 1.95	2.1591	23 29 26.4	5.823	7	5 19 59.33	2.3639	49 55.9	0.392
8	3 33 11.83	2.1670	23 35 12.5	5.715	8	5 22 21.07	2.3657	49 35.9	0.405
9	3 35 22.00	2.1718	23 40 52.1	5.607	9	5 24 42.98	2.3686	49 7.3	0.845
10	3 37 32.46	2.1767	23 46 25.2	5.497	10	5 27 5.05	2.3692	48 30.1	0.892
11	3 39 43.21	2.1816	23 51 51.7	5.386	11	5 29 27.27	2.3717	47 44.2	0.537
12	3 41 54.26	2.1865	23 57 11.5	5.275	12	5 31 49.65	2.3741	46 49.5	0.958
13	3 44 5.60	2.1913	24 2 24.6	5.163	13	5 34 12.17	2.3765	45 46.0	1.120
14	3 46 17.23	2.1961	24 7 31.0	5.050	14	5 36 34.83	2.3788	44 33.8	1.277
15	3 48 29.15	2.2009	24 12 30.6	4.936	15	5 38 57.63	2.3810	43 12.8	1.428
16	3 50 41.35	2.2067	24 17 23.3	4.821	16	5 41 20.56	2.3832	41 43.0	1.570
17	3 52 53.84	2.2105	24 22 9.1	4.706	17	5 43 43.63	2.3853	40 4.4	1.717
18	3 55 6.61	2.2153	24 26 47.9	4.590	18	5 46 6.82	2.3875	38 16.9	1.865
19	3 57 19.67	2.2200	24 31 19.7	4.473	19	5 48 30.12	2.3893	36 20.6	2.013
20	3 59 33.01	2.2247	24 35 44.5	4.354	20	5 50 53.54	2.3913	34 15.4	2.160
21	4 1 46.63	2.2294	24 40 2.2	4.236	21	5 53 17.06	2.3935	32 1.3	2.308
22	4 4 0.53	2.2340	24 44 12.8	4.117	22	5 55 40.68	2.3955	29 38.3	2.456
23	4 6 14.70	2.2386	24 48 16.3	3.997	23	5 58 4.41	2.3983	27 6.3	2.603
	4 8 29.15	2.2432	N. 24° 52'	3.876		6 0 28.23	2.3977	N. 25° 24'	2.797
MONDAY 18.					WEDNESDAY 20.				
0	4 10 43.88	2.2477	N. 24° 56'	3.752	0	6 2 52.14	2.3991	N. 25° 21'	3.907
1	4 12 58.88	2.2523	24 59 42.5	3.629	1	6 5 16.13	2.4005	18 36.5	3.957
2	4 15 14.14	2.2566	25 3 16.5	3.505	2	6 7 40.20	2.4018	15 26.6	3.907
3	4 17 29.67	2.2610	25 6 43.0	3.380	3	6 10 4.35	2.4030	12 11.7	3.857
4	4 19 45.47	2.2654	25 10 2.1	3.255	4	6 12 28.57	2.4041	8 45.8	3.807
5	4 22 1.53	2.2698	25 13 13.6	3.130	5	6 14 52.85	2.4051	5 10.9	3.857
6	4 24 17.85	2.2741	25 16 17.5	3.002	6	6 17 17.19	2.4060	25 1 27.0	3.807
7	4 26 34.43	2.2783	25 19 13.7	2.874	7	6 19 41.58	2.4069	24 57 34.1	3.967
8	4 28 51.26	2.2825	25 22 2.2	2.745	8	6 22 6.02	2.4078	24 53 32.1	4.105
9	4 31 8.34	2.2867	25 24 43.0	2.615	9	6 24 30.50	2.4088	24 49 21.1	4.260
10	4 33 25.67	2.2909	25 27 16.0	2.485	10	6 26 55.02	2.4099	24 45 1.1	4.409
11	4 35 43.25	2.2950	25 29 41.2	2.355	11	6 29 19.57	2.4094	24 40 32.0	4.540
12	4 38 1.07	2.2990	25 31 58.5	2.223	12	6 31 44.15	2.4098	24 35 53.9	4.710
13	4 40 19.13	2.3030	25 34 7.9	2.090	13	6 34 8.75	2.4103	24 31 6.8	4.890
14	4 42 37.43	2.3069	25 36 9.3	1.957	14	6 36 33.37	2.4106	24 26 10.7	5.010
15	4 44 55.96	2.3107	25 38 2.7	1.823	15	6 38 58.01	2.4107	24 21 5.6	5.160
16	4 47 14.72	2.3145	25 39 43.0	1.689	16	6 41 22.66	2.4108	24 15 51.5	5.310
17	4 49 33.70	2.3183	25 41 25.2	1.554	17	6 43 47.32	2.4110	24 10 28.4	5.460
18	4 51 52.90	2.3219	25 42 54.3	1.418	18	6 46 11.98	2.4110	24 4 56.3	5.610
19	4 54 12.32	2.3255	25 44 15.3	1.282	19	6 48 36.64	2.4109	23 59 15.2	5.760
20	4 56 31.96	2.3290	25 45 28.1	1.145	20	6 51 1.29	2.4107	23 53 25.1	5.910
21	4 58 51.81	2.3325	25 46 32.6	1.007	21	6 53 25.93	2.4106	23 47 26.1	6.060
22	5 1 11.87	2.3359	25 47 28.8	0.869	22	6 55 50.55	2.4103	23 41 18.1	6.207
23	5 3 32.14	2.3393	25 48 16.7	0.730	23	6 58 15.14	2.4098	23 35 1.2	6.355
24	5 5 52.60	2.3426	N. 25° 48'	0.590	24	7 0 39.71	2.4093	N. 23° 28'	6.504

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	7 0 39.71	2.4008	N.23° 28' 35.4"	6.804	0	8 54 44.26	2.3306	N.15° 37' 15.6"	12.002
1	7 3 4.25	2.4007	23 22 0.7	6.803	1	8 57 4.02	2.3304	15 24 24.3	12.008
2	7 5 28.75	2.4001	23 15 17.2	6.799	2	8 59 23.66	2.3303	15 11 26.7	12.013
3	7 7 53.21	2.4074	23 8 24.9	6.845	3	9 1 43.17	2.3242	14 58 22.7	12.117
4	7 10 17.63	2.4067	23 1 23.9	7.001	4	9 4 2.56	2.3221	14 45 12.5	12.219
5	7 12 42.01	2.4000	22 54 14.1	7.337	5	9 6 21.82	2.3200	14 31 56.2	12.319
6	7 15 6.34	2.4043	22 46 55.5	7.383	6	9 8 40.95	2.3178	14 18 34.0	12.418
7	7 17 30.62	2.4043	22 39 28.1	7.620	7	9 10 59.95	2.3166	14 5 6.0	12.515
8	7 19 54.84	2.4023	22 31 52.0	7.674	8	9 13 18.82	2.3134	13 51 32.2	12.611
9	7 22 18.90	2.4021	22 24 7.2	7.818	9	9 15 37.56	2.3114	13 37 52.7	12.706
10	7 24 43.08	2.4010	22 16 13.8	7.902	10	9 17 56.18	2.3094	13 24 7.5	12.800
11	7 27 7.10	2.3998	22 8 11.8	8.106	11	9 20 14.69	2.3073	13 10 16.6	12.898
12	7 29 31.05	2.3993	22 0 1.2	8.247	12	9 22 33.08	2.3046	12 56 20.2	12.994
13	7 31 54.92	2.3973	21 51 42.1	8.389	13	9 24 51.35	2.3036	12 42 18.5	14.073
14	7 34 18.71	2.3960	21 43 14.5	8.580	14	9 27 9.50	2.3018	12 28 11.5	14.160
15	7 36 42.42	2.3946	21 34 38.5	8.670	15	9 29 27.53	2.3006	12 13 59.3	14.245
16	7 39 6.05	2.3933	21 25 54.1	8.810	16	9 31 45.44	2.2977	11 59 42.1	14.329
17	7 41 29.50	2.3917	21 17 1.3	8.990	17	9 34 3.24	2.2966	11 45 19.8	14.413
18	7 43 53.04	2.3901	21 8 0.1	9.099	18	9 36 20.93	2.2940	11 30 52.6	14.493
19	7 46 16.40	2.3896	20 58 50.6	9.237	19	9 38 38.52	2.2923	11 16 20.6	14.573
20	7 48 39.66	2.3890	20 49 32.9	9.383	20	9 40 56.00	2.2906	11 1 43.9	14.660
21	7 51 2.82	2.3861	20 40 7.0	9.480	21	9 43 13.37	2.2887	10 47 2.6	14.737
22	7 53 25.68	2.3834	20 30 33.0	9.684	22	9 45 30.64	2.2870	10 32 16.7	14.802
23	7 55 48.83	2.3817	N.20 20 50.9	9.785	23	9 47 47.81	2.2843	N.10 17 26.3	14.875
FRIDAY 22.					SUNDAY 24.				
0	7 58 11.68	2.3800	N.20 11 0.8	9.808	0	9 50 4.88	2.2827	N.10 2 31.5	14.947
1	8 0 34.42	2.3792	20 1 2.7	10.005	1	9 52 21.85	2.2800	9 47 32.5	15.017
2	8 2 57.05	2.3769	19 50 56.6	10.167	2	9 54 38.72	2.2804	9 32 29.4	15.066
3	8 5 19.57	2.3744	19 40 42.6	10.380	3	9 56 55.50	2.2789	9 17 22.3	15.151
4	8 7 41.97	2.3738	19 30 20.7	10.430	4	9 59 12.20	2.2774	9 2 11.3	15.215
5	8 10 4.26	2.3706	19 19 51.0	10.660	5	10 1 28.81	2.2760	8 46 56.5	15.278
6	8 12 26.43	2.3697	19 9 13.6	10.897	6	10 3 45.33	2.2747	8 31 37.9	15.340
7	8 14 48.49	2.3667	18 58 28.7	10.514	7	10 6 1.77	2.2733	8 16 15.6	15.400
8	8 17 10.43	2.3647	18 47 36.2	10.980	8	10 8 18.13	2.2730	8 0 49.8	15.468
9	8 19 32.25	2.3637	18 36 36.1	11.083	9	10 10 34.41	2.2708	7 45 20.6	15.514
10	8 21 53.94	2.3606	18 25 28.5	11.187	10	10 12 50.62	2.2696	7 29 48.1	15.568
11	8 24 15.51	2.3596	18 14 13.5	11.310	11	10 15 6.76	2.2684	7 14 12.4	15.620
12	8 26 36.95	2.3564	18 2 51.2	11.482	12	10 17 22.83	2.2673	6 58 33.5	15.671
13	8 28 58.27	2.3548	17 51 21.6	11.563	13	10 19 38.83	2.2662	6 42 51.6	15.721
14	8 31 19.46	2.3523	17 39 44.8	11.673	14	10 21 54.77	2.2653	6 27 6.8	15.769
15	8 33 40.52	2.3500	17 28 0.8	11.792	15	10 24 10.65	2.2642	6 11 19.2	15.816
16	8 36 1.45	2.3478	17 16 9.8	11.900	16	10 26 26.47	2.2633	5 55 29.0	15.860
17	8 38 22.25	2.3467	17 4 11.8	12.026	17	10 28 42.24	2.2626	5 39 36.2	15.901
18	8 40 42.92	2.3456	16 52 6.9	12.140	18	10 30 57.96	2.2617	5 23 40.9	15.941
19	8 43 3.47	2.3416	16 39 55.1	12.284	19	10 33 13.64	2.2608	5 7 43.2	15.979
20	8 45 23.89	2.3399	16 27 36.4	12.367	20	10 35 29.27	2.2602	4 51 43.3	16.015
21	8 47 44.18	2.3373	16 15 11.0	12.478	21	10 37 44.86	2.2606	4 35 41.3	16.060
22	8 50 4.34	2.3340	16 2 39.0	12.567	22	10 40 0.41	2.2599	4 19 37.2	16.083
23	8 52 24.37	2.3328	15 50 0.5	12.686	23	10 42 15.93	2.2584	4 3 31.1	16.116
24	8 54 44.26	2.3306	N.15 37 15.6	12.802	24	10 44 31.42	2.2579	N. 3 47 23.2	16.146

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	10 44 31.42	2.2679	N. 3° 47' 23.2	16.145	0	12 33 28.76	2.3047	S. 9° 5' 52.6	15.382
1	10 46 46.88	2.2676	3 31 13.6	16.173	1	12 35 47.11	2.3070	9 21 11.9	15.380
2	10 49 2.32	2.2673	3 15 2.4	16.199	2	12 38 5.60	2.3093	9 36 27.4	15.377
3	10 51 17.74	2.2669	2 58 49.8	16.222	3	12 40 24.22	2.3117	9 51 39.2	15.362
4	10 53 33.14	2.2667	2 42 35.8	16.243	4	12 42 42.99	2.3142	10 6 47.0	15.366
5	10 55 48.53	2.2665	2 26 20.5	16.268	5	12 45 1.91	2.3167	10 21 50.7	15.356
6	10 58 3.91	2.2663	2 10 4.1	16.282	6	12 47 20.99	2.3193	10 36 50.1	14.965
7	11 0 19.28	2.2662	1 53 46.6	16.299	7	12 49 40.23	2.3218	10 51 45.2	14.893
8	11 2 34.65	2.2662	1 37 28.2	16.313	8	12 51 59.63	2.3246	11 6 35.9	14.808
9	11 4 50.02	2.2662	1 21 9.0	16.326	9	12 54 19.18	2.3273	11 21 22.1	14.731
10	11 7 5.39	2.2663	1 4 49.1	16.336	10	12 56 38.89	2.3300	11 36 3.7	14.633
11	11 9 20.77	2.2665	0 48 28.6	16.345	11	12 58 58.77	2.3327	11 50 40.6	14.574
12	11 11 36.16	2.2667	0 32 7.6	16.353	12	13 1 18.82	2.3355	12 5 12.6	14.493
13	11 13 51.57	2.2670	N. 0° 15' 46.2	16.359	13	13 3 39.04	2.3383	12 19 39.7	14.410
14	11 16 7.00	2.2673	S. 0 0 35.4	16.363	14	13 5 59.43	2.3412	12 34 1.8	14.336
15	11 18 22.45	2.2677	0 16 57.2	16.363	15	13 8 19.98	2.3440	12 48 18.8	14.260
16	11 20 37.93	2.2682	0 33 19.0	16.362	16	13 10 40.70	2.3469	13 2 30.5	14.193
17	11 22 53.44	2.2688	0 49 40.7	16.360	17	13 13 1.60	2.3499	13 16 36.9	14.092
18	11 25 8.99	2.2694	1 6 2.1	16.356	18	13 15 22.68	2.3529	13 30 37.9	13.971
19	11 27 24.57	2.2690	1 22 23.3	16.350	19	13 17 43.95	2.3560	13 44 33.4	13.878
20	11 29 40.19	2.2696	1 38 44.1	16.343	20	13 20 5.40	2.3590	13 58 23.2	13.763
21	11 31 55.85	2.2613	1 55 4.3	16.332	21	13 22 27.03	2.3620	14 12 7.3	13.667
22	11 34 11.56	2.2622	2 11 23.8	16.320	22	13 24 48.84	2.3650	14 25 45.6	13.569
23	11 36 27.32	2.2632	S. 2 27 42.6	16.306	23	13 27 10.84	2.3681	S. 14 39 18.0	13.460
TUESDAY 26.					THURSDAY 28.				
0	11 38 43.14	2.2642	S. 2 44 0.5	16.290	0	13 29 33.02	2.3713	S. 14 52 44.4	13.390
1	11 40 59.02	2.2652	3 0 17.4	16.273	1	13 31 55.38	2.3743	15 6 4.7	13.386
2	11 43 14.96	2.2662	3 16 33.2	16.263	2	13 34 17.94	2.3776	15 19 18.8	13.184
3	11 45 30.97	2.2673	3 32 47.8	16.253	3	13 36 40.69	2.3807	15 32 26.6	13.077
4	11 47 47.05	2.2685	3 49 1.0	16.200	4	13 39 3.63	2.3838	15 45 27.9	12.966
5	11 50 3.20	2.2698	4 5 12.8	16.184	5	13 41 26.76	2.3870	15 58 22.7	12.860
6	11 52 19.43	2.2711	4 21 23.0	16.157	6	13 43 50.08	2.3902	16 11 11.0	12.761
7	11 54 35.74	2.2725	4 37 31.6	16.129	7	13 46 13.59	2.3933	16 23 52.8	12.640
8	11 56 52.14	2.2740	4 53 38.4	16.099	8	13 48 37.29	2.3964	16 36 27.9	12.527
9	11 59 8.63	2.2756	5 9 43.3	16.067	9	13 51 1.18	2.3997	16 48 56.1	12.413
10	12 1 25.21	2.2772	5 25 46.2	16.032	10	13 53 25.26	2.4029	17 1 17.4	12.296
11	12 3 41.89	2.2788	5 41 46.9	15.996	11	13 55 49.54	2.4061	17 13 31.6	12.178
12	12 5 58.66	2.2804	5 57 45.4	15.967	12	13 58 14.01	2.4093	17 25 38.7	12.060
13	12 8 15.54	2.2821	6 13 41.6	15.917	13	14 0 38.67	2.4126	17 37 38.7	11.940
14	12 10 32.52	2.2838	6 29 35.3	15.876	14	14 3 3.52	2.4157	17 49 31.4	11.819
15	12 12 49.60	2.2855	6 45 26.4	15.831	15	14 5 28.56	2.4188	18 1 16.8	11.696
16	12 15 6.79	2.2875	7 1 14.8	15.785	16	14 7 53.79	2.4220	18 12 54.8	11.572
17	12 17 24.10	2.2895	7 17 0.4	15.737	17	14 10 19.21	2.4252	18 24 25.3	11.447
18	12 19 41.53	2.2915	7 32 43.1	15.687	18	14 12 44.82	2.4283	18 35 48.3	11.321
19	12 21 59.08	2.2935	7 48 22.9	15.636	19	14 15 10.62	2.4314	18 47 3.7	11.196
20	12 24 16.75	2.2955	8 3 59.5	15.583	20	14 17 36.60	2.4345	18 58 11.4	11.063
21	12 26 34.55	2.2978	8 19 32.9	15.528	21	14 20 2.76	2.4376	19 9 11.2	10.933
22	12 28 52.48	2.3000	8 35 3.0	15.473	22	14 22 29.11	2.4407	19 20 3.1	10.800
23	12 31 10.55	2.3023	8 50 29.6	15.413	23	14 24 55.64	2.4437	19 30 47.1	10.667
24	12 33 28.76	2.3047	S. 9 5 52.6	15.352	24	14 27 22.36	2.4468	S. 19 41 23.1	10.535

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.

☾ Last Quarter,	^d	^h	^m
● New Moon,	1	21	59.9
☾ First Quarter,	9	8	4.6
○ Full Moon,	17	12	19.6
	24	16	43.4

☾ Apogee,	^d	^h
☾ Perigee,	13	23.4
	26	1.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Pollux W.	99° 52' 2"	2220	101° 37' 32"	2228	103° 22' 50"	2227	105° 7' 55"	2247
	Jupiter W.	67 36 55	2222	69 23 50	2270	71 10 33	2270	72 57 4	2227
	Regulus W.	62 55 37	2201	64 41 36	2209	66 27 23	2217	68 12 57	2226
	Saturn W.	53 10 13	2201	54 56 11	2200	56 41 58	2216	58 27 35	2224
	Antares E.	37 1 31	2222	35 15 20	2200	33 29 21	2209	31 43 35	2216
	Venus E.	77 21 52	2227	75 44 54	2226	74 8 9	2706	72 31 36	2716
	α Aquilæ E.	91 48' 11	2222	90 14 51	2221	88 41 42	2270	87 8 45	2221
	SUN E.	101 58 3	2212	100 19 26	2224	98 41 3	2223	97 2 53	2242
2	Jupiter W.	81 46 32	2220	83 31 48	2220	85 16 51	2248	87 1 41	2257
	Regulus W.	76 57 43	2220	78 42 2	2272	80 26 8	2227	82 10 2	2226
	Saturn W.	67 12 49	2222	68 57 17	2272	70 41 32	2220	72 25 36	2220
	Spica W.	23 0 4	2402	24 43 35	2407	26 27 0	2417	28 10 19	2417
	Antares E.	22 58 1	2224	21 13 34	2272	19 29 21	2222	17 45 22	2224
	Venus E.	64 32 3	2722	62 56 47	2772	61 21 43	2722	59 46 53	2722
	α Aquilæ E.	79 27 47	2242	77 56 29	2226	76 25 32	2222	74 54 58	2201
	SUN E.	88 55 13	2220	87 18 20	2720	85 41 40	2712	84 5 13	2712
3	Jupiter W.	95 42 38	2401	97 26 11	2410	99 9 31	2419	100 52 38	2422
	Regulus W.	90 46 17	2441	92 28 53	2420	94 11 17	2420	95 53 28	2422
	Saturn W.	81 2 49	2422	82 45 38	2441	84 28 15	2449	86 10 40	2422
	Spica W.	36 44 39	2421	38 27 1	2420	40 9 12	2427	41 51 12	2472
	Venus E.	51 55 58	2242	50 22 25	2222	48 49 5	2222	47 15 58	2272
	α Aquilæ E.	67 28 31	2117	66 0 42	2144	64 33 26	2172	63 6 45	2204
	SUN E.	76 6 11	2720	74 31 2	2772	72 56 6	2722	71 21 23	2722
4	Jupiter W.	102 25 5	2472	111 6 57	2422	112 48 36	2421	114 31 2	2422
	Regulus W.	104 21 12	2212	106 2 7	2222	107 42 50	2220	109 23 21	2240
	Saturn W.	94 39 37	2222	96 20 47	2211	98 1 45	2220	99 42 31	2222
	Spica W.	50 18 22	2216	51 59 13	2224	53 39 53	2222	55 20 22	2240
	Venus E.	39 33 33	2221	38 1 41	2221	36 30 2	2241	34 58 35	2220
	α Aquilæ E.	56 3 25	2222	54 41 4	2442	53 19 36	2424	51 59 5	2242
	SUN E.	63 30 57	2247	61 57 30	2222	60 24 15	2222	58 51 13	2272
5	Saturn W.	108 3 14	2272	109 42 46	2222	111 22 6	2221	113 1 13	2220
	Spica W.	63 39 52	2222	65 19 11	2221	66 58 19	2222	68 37 16	2227
	Antares W.	17 53 55	2272	19 33 20	2222	21 12 34	2222	22 51 36	2222
	Venus E.	27 24 21	2222	25 54 6	2222	24 24 3	2217	22 54 11	2227
	SUN E.	51 9 6	2224	49 37 17	2224	48 5 41	2242	46 34 17	2222
6	Spica W.	76 49 9	2242	78 26 58	2227	80 4 36	2222	81 42 3	2274
	Antares W.	31 4 4	2242	32 42 0	2222	34 19 45	2220	35 57 19	2222
	SUN E.	39 0 16	2201	37 30 4	2210	36 0 4	2221	34 30 17	2221
11	SUN W.	19 5 36	2224	20 28 11	2222	21 50 41	2222	23 13 5	2222
	Mars E.	44 22 48	2222	42 57 45	2222	41 32 53	2274	40 8 11	2222
	α Arietis E.	54 5 33	2222	52 35 15	2224	51 5 7	2212	49 35 10	2221
	Aldebaran E.	86 44 32	2227	85 14 53	2224	83 45 23	2241	82 16 1	2242
12	SUN W.	30 3 46	2422	31 25 36	2422	32 47 21	2422	34 9 1	2422
	Mars E.	33 7 28	2222	31 43 54	2242	30 20 31	2222	28 57 21	2222
	α Arietis E.	42 7 52	2220	40 38 54	2222	39 10 5	2277	37 41 27	2222
	Aldebaran E.	74 51 25	2222	73 22 55	2221	71 54 34	2222	70 26 20	2122
	Pollux E.	116 50 44	2222	115 21 44	2224	113 52 50	2222	112 24 2	2272

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Pollux	W.	106° 52' 46"	2266	106° 37' 24"	2266	110° 21' 48"	2275	112° 5' 58"	2284
	Jupiter	W.	74 43 23	2266	76 29 29	2264	78 15 22	2213	80 1 3	2221
	Regulus	W.	69 58 19	2234	71 43 29	2243	73 28 26	2241	75 13 11	2260
	Saturn	W.	60 13 0	2231	61 58 14	2239	63 43 17	2246	65 28 9	2255
	Antares	E.	29 58 2	2237	28 12 42	2236	26 27 35	2245	24 42 41	2255
	Venus	E.	70 55 16	2726	69 19 9	2724	67 43 14	2744	66 7 32	2753
	α Aquilæ	E.	85 36 2	2692	84 3 33	2695	82 31 20	2618	80 59 24	2623
	SUN	E.	95 24 56	2662	93 47 11	2660	92 9 38	2671	90 32 19	2681
2	Jupiter	W.	88 46 18	2266	90 30 42	2275	92 14 53	2283	93 58 52	2292
	Regulus	W.	83 53 43	2406	85 37 11	2414	87 20 26	2423	89 3 28	2432
	Saturn	W.	74 9 27	2297	75 53 6	2406	77 36 33	2415	79 19 47	2423
	Spica	W.	29 53 30	2424	31 36 31	2420	33 19 23	2426	35 2 6	2443
	Antares	E.	16 1 38	2404	14 18 9	2415	12 34 56	2426	10 51 59	2438
	Venus	E.	58 12 16	2693	56 37 52	2613	55 3 41	2623	53 29 43	2633
	α Aquilæ	E.	73 24 47	2623	71 55 1	2643	70 25 42	2667	68 56 52	2691
	SUN	E.	82 28 58	2729	80 52 56	2729	79 17 8	2749	77 41 33	2759
3	Jupiter	W.	102 35 33	2427	104 18 15	2446	106 0 44	2465	107 43 1	2484
	Regulus	W.	97 35 26	2477	99 17 11	2486	100 58 44	2495	102 40 4	2504
	Saturn	W.	87 52 52	2467	89 34 52	2476	91 16 39	2485	92 58 14	2493
	Spica	W.	43 33 1	2463	45 14 38	2491	46 56 4	2499	48 37 19	2507
	Venus	E.	45 43 4	2692	44 10 22	2692	42 37 53	2692	41 5 37	2612
	α Aquilæ	E.	61 40 41	2628	60 15 17	2673	58 50 34	2612	57 26 36	2652
	SUN	E.	69 46 52	2696	68 12 34	2618	66 38 29	2626	65 4 37	2637
4	Jupiter	W.	116 11 16	2609	117 55 17	2617	119 36 6	2626	121 16 43	2635
	Regulus	W.	111 3 39	2649	112 43 44	2657	114 23 38	2666	116 3 19	2675
	Saturn	W.	101 23 4	2528	103 3 25	2546	104 43 34	2566	106 23 30	2584
	Spica	W.	57 0 39	2648	58 40 45	2657	60 20 39	2666	62 0 21	2674
	Venus	E.	33 27 20	2690	31 56 17	2699	30 25 26	2690	28 54 48	2699
	α Aquilæ	E.	50 39 35	2698	49 21 9	2672	48 3 52	2742	46 47 49	2817
	SUN	E.	57 18 23	2695	55 45 45	2695	54 13 20	2695	52 41 7	2614
5	Saturn	W.	114 40 8	2610	116 18 50	2618	117 57 20	2627	119 35 36	2637
	Spica	W.	70 16 1	2615	71 54 35	2624	73 32 58	2632	75 11 9	2640
	Antares	W.	24 30 28	2610	26 9 9	2619	27 47 38	2626	29 25 57	2635
	Venus	E.	21 24 32	2636	19 55 4	2646	18 25 48	2655	16 56 45	2665
	SUN	E.	45 3 4	2692	43 32 4	2672	42 1 16	2691	40 30 40	2691
6	Spica	W.	83 19 18	2692	84 56 22	2699	86 33 15	2699	88 9 57	2707
	Antares	W.	37 34 42	2676	39 11 54	2685	40 48 54	2692	42 25 44	2701
	SUN	E.	33 0 43	2642	31 31 22	2662	30 2 13	2682	28 33 17	2673
11	SUN	W.	24 35 24	2402	25 57 38	2407	27 19 47	2412	28 41 50	2418
	Mars	E.	38 43 40	2394	37 19 21	2392	35 55 12	2312	34 31 14	2322
	α Arietis	E.	48 5 23	2629	46 35 46	2696	45 6 18	2644	43 37 0	2692
	Aldebaran	E.	80 46 49	2666	79 17 46	2698	77 48 51	2696	76 20 4	2676
12	SUN	W.	35 30 37	2441	36 52 7	2446	38 13 31	2451	39 34 50	2454
	Mars	E.	27 34 24	2377	26 11 41	2389	24 49 12	2402	23 26 58	2416
	α Arietis	E.	36 12 59	2696	34 44 41	2101	33 16 33	2110	31 48 36	2119
	Aldebaran	E.	68 58 14	2109	67 30 15	2115	66 2 24	2121	64 34 40	2127
	Pollux	E.	110 55 20	2678	109 26 43	2692	107 58 11	2696	106 29 44	2699

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
13	SUN	W.	40° 56' 5"	3458	42° 17' 16"	3463	43° 38' 23"	3468	44° 59' 26"	3468
	Aldebaran	E.	63 7 3	3183	61 39 33	3186	60 12 9	3148	58 44 52	3149
	Pollux	E.	105 1 21	3023	103 33 2	3086	102 4 47	3099	100 36 36	3101
14	SUN	W.	51 44 3	3477	53 4 53	3478	54 25 42	3477	55 46 32	3477
	Aldebaran	E.	51 30 1	3173	50 3 20	3178	48 36 45	3183	47 10 16	3186
	Pollux	E.	93 16 21	3119	91 48 23	3110	90 20 26	3111	88 52 30	3111
15	SUN	W.	62 30 52	3471	63 51 49	3407	65 12 50	3463	66 33 55	3469
	Aldebaran	E.	39 59 22	3316	38 33 31	3233	37 7 49	3236	35 42 15	3239
	Pollux	E.	81 32 42	3105	80 4 39	3103	78 36 33	3101	77 8 24	3098
	Jupiter	E.	111 58 3	3088	110 28 37	3086	108 59 9	3038	107 29 37	3029
	Regulus	E.	118 29 20	3087	117 0 54	3063	115 32 24	3061	114 3 51	3077
16	SUN	W.	73 20 35	3436	74 42 12	3437	76 3 58	3419	77 25 53	3410
	Pollux	E.	69 46 35	3077	68 17 57	3071	66 49 12	3066	65 20 19	3060
	Jupiter	E.	100 0 38	3006	98 30 31	2999	97 0 17	2993	95 29 55	2986
	Regulus	E.	106 39 47	3053	105 10 39	3046	103 41 23	3039	102 11 58	3033
	Saturn	E.	115 21 26	3039	113 52 2	3033	112 22 29	3026	110 52 48	3018
17	SUN	W.	84 17 51	3366	85 40 47	3364	87 3 56	3343	88 27 18	3333
	Mars	W.	23 35 3	3333	24 58 49	3303	26 22 58	3264	27 47 28	3266
	α Arietis	W.	18 8 22	3187	19 35 47	3107	21 3 48	3081	22 32 21	3066
	Pollux	E.	57 53 51	3023	56 24 5	3013	54 54 8	3006	53 24 1	2996
	Jupiter	E.	87 55 41	2943	86 24 16	2933	84 52 39	2924	83 20 50	2913
	Regulus	E.	94 42 32	2989	93 12 5	2979	91 41 26	2969	90 10 34	2956
	Saturn	E.	103 21 52	2973	101 51 6	2954	100 20 8	2954	98 48 57	2942
18	SUN	W.	95 27 41	3365	96 52 33	3361	98 17 42	3336	99 43 8	3321
	Mars	W.	34 55 9	3190	36 21 42	3163	37 48 36	3146	39 15 51	3126
	α Arietis	W.	30 2 16	3060	31 33 31	2983	33 5 9	2914	34 37 10	2896
	Pollux	E.	45 50 28	2946	44 19 8	2937	42 47 36	2927	41 15 51	2916
	Jupiter	E.	75 38 7	2882	74 4 47	2840	72 31 11	2827	70 57 18	2818
	Regulus	E.	82 32 38	2898	81 0 16	2864	79 27 37	2870	77 54 40	2856
	Saturn	E.	91 9 22	2981	89 36 39	2906	88 3 39	2956	86 30 22	2941
19	SUN	W.	106 55 1	3186	108 22 24	3121	109 50 8	3104	111 18 13	3095
	Mars	W.	46 37 25	3039	48 6 50	3030	49 36 38	3001	51 6 49	2993
	α Arietis	W.	42 23 2	3005	43 57 23	2786	45 32 7	2769	47 7 15	2760
	Pollux	E.	33 33 58	2870	32 1 1	2863	30 27 55	2856	28 54 42	2854
	Jupiter	E.	63 3 12	2786	61 27 22	2733	59 51 12	2707	58 14 41	2691
	Regulus	E.	70 5 13	2780	68 30 19	2766	66 55 5	2748	65 19 29	2733
	Saturn	E.	78 39 14	2766	77 4 1	2749	75 28 26	2733	73 52 30	2717
20	SUN	W.	118 44 20	2991	120 14 44	2973	121 45 32	2953	123 16 44	2934
	Mars	W.	58 43 46	2985	60 16 24	2906	61 49 27	2846	63 22 55	2836
	α Arietis	W.	55 9 6	2657	56 46 44	2636	58 24 47	2619	60 3 16	2600
	Aldebaran	W.	23 56 3	2680	25 26 55	2613	26 58 58	2603	28 32 5	2618
	Jupiter	E.	50 6 33	2606	48 27 46	2609	46 48 36	2673	45 9 2	2656
	Regulus	E.	57 15 52	2646	55 37 58	2628	53 59 41	2610	52 20 59	2603
	Saturn	E.	65 47 18	2633	64 9 6	2614	62 30 30	2607	60 51 31	2580
	Spica	E.	111 18 37	2641	109 40 38	2633	108 2 14	2604	106 23 25	2586
21	Mars	W.	71 16 49	2735	72 52 55	2706	74 29 28	2696	76 6 27	2686
	α Arietis	W.	68 22 15	2604	70 3 23	2486	71 44 57	2406	73 26 58	2448

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
13	SUN	W.	46° 20' 26"	2471	47° 41' 23"	2473	49° 2' 18"	2474	50° 23' 11"	2475
	Aklebaran	E.	57 17 42	2154	55 50 38	2159	54 23 40	2163	52 56 47	2169
	Pollux	E.	99 8 28	2103	97 40 23	2106	96 12 19	2108	94 44 19	2110
14	SUN	W.	57 7 22	2476	58 28 13	2476	59 49 5	2474	61 9 58	2473
	Aldebaran	E.	45 43 53	2193	44 17 36	2196	42 51 25	2204	41 25 20	2209
	Pollux	E.	87 24 34	2110	85 56 37	2110	84 28 40	2110	83 0 42	2108
15	SUN	W.	67 55 5	2484	69 16 20	2486	70 37 40	2448	71 59 5	2441
	Aldebaran	E.	34 16 52	2246	32 51 40	2259	31 26 41	2273	30 1 57	2288
	Pollux	E.	75 40 12	2004	74 11 55	2001	72 43 34	2006	71 15 7	2002
	Jupiter	E.	106 0 0	2026	104 30 18	2021	103 0 31	2016	101 30 38	2010
	Regulus	E.	112 35 13	2073	111 6 30	2089	109 37 42	2064	108 8 48	2066
16	SUN	W.	78 47 58	2492	80 10 12	2494	81 32 35	2386	82 55 8	2377
	Pollux	E.	63 51 19	2062	62 22 10	2046	60 52 53	2036	59 23 27	2030
	Jupiter	E.	93 59 25	2078	92 28 45	2070	90 57 55	2063	89 26 54	2052
	Regulus	E.	100 42 25	2034	99 12 42	2018	97 42 49	2006	96 12 46	2000
	Saturn	E.	109 22 58	2010	107 52 58	2001	106 22 47	2003	104 52 25	2004
17	SUN	W.	89 50 53	2519	91 14 42	2506	92 38 46	2294	94 3 5	2279
	Mars	W.	29 12 19	2246	30 37 31	2231	32 3 3	2214	33 28 56	2197
	α Arietis	W.	24 1 25	2082	25 30 58	2008	27 0 59	2009	28 31 25	2000
	Pollux	E.	51 53 42	2006	50 23 12	2077	48 52 30	2066	47 21 35	2067
	Jupiter	E.	81 48 47	2001	80 16 30	2000	78 43 58	2078	77 11 11	2066
	Regulus	E.	88 39 28	2046	87 8 8	2026	85 36 34	2023	84 4 44	2010
	Saturn	E.	97 17 32	2021	95 45 52	2020	94 13 58	2007	92 41 48	2004
18	SUN	W.	101 8 52	2506	102 34 55	2499	104 1 17	2173	105 27 59	2166
	Mars	W.	40 43 27	2110	42 11 24	2092	43 39 43	2075	45 8 23	2067
	α Arietis	W.	36 9 34	2078	37 42 21	2000	39 15 31	2003	40 49 5	2004
	Pollux	E.	39 43 53	2006	38 11 42	2007	36 39 19	2007	35 6 44	2079
	Jupiter	E.	69 23 7	2100	67 48 38	2106	66 13 50	2109	64 38 42	2103
	Regulus	E.	76 21 25	2042	74 47 51	2027	73 13 58	2013	71 39 46	2106
	Saturn	E.	84 56 47	2026	83 22 53	2011	81 48 40	2106	80 14 7	2101
19	SUN	W.	112 46 41	2507	114 15 31	2506	115 44 44	2030	117 14 20	2010
	Mars	W.	52 37 24	2063	54 8 23	2044	55 39 46	2024	57 11 34	2005
	α Arietis	W.	48 42 48	2122	50 18 45	2118	51 55 7	2006	53 31 54	2076
	Pollux	E.	27 21 24	2062	25 48 4	2043	24 14 45	2037	22 41 31	2066
	Jupiter	E.	56 37 49	2076	55 0 35	2047	53 22 58	2040	51 44 57	2023
	Regulus	E.	63 43 31	2116	62 7 11	2009	60 30 28	2001	58 53 22	2063
	Saturn	E.	72 16 13	2100	70 39 33	2084	69 2 31	2006	67 25 6	2049
20	SUN	W.	124 48 20	2614	126 20 21	2604	127 52 47	2078	129 25 38	2064
	Mars	W.	64 56 49	2006	66 31 9	2106	68 5 56	2100	69 41 9	2145
	α Arietis	W.	61 42 11	2061	63 21 32	2061	65 1 20	2043	66 41 34	2023
	Aldebaran	W.	30 6 10	2176	31 41 9	2130	33 16 59	2102	34 53 36	2090
	Jupiter	E.	43 29 5	2036	41 48 44	2020	40 7 59	2003	38 26 50	2466
	Regulus	E.	50 41 53	2074	49 2 23	2066	47 22 28	2038	45 42 8	2020
	Saturn	E.	59 12 8	2062	57 32 21	2046	55 52 10	2027	54 11 34	2010
	Spica	E.	104 44 11	2007	103 4 31	2049	101 24 25	2030	99 43 53	2011
21	Mars	W.	77 43 53	2046	79 21 45	2026	81 0 4	2007	82 38 49	2000
	α Arietis	W.	75 9 25	2029	76 52 19	2010	78 35 39	2001	80 19 26	2074

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
21	Aldebaran W.	36° 30' 58"	2688	38° 9' 2"	2608	39° 47' 46"	2580	41° 27' 8"	2608
	Jupiter E.	36 45 17	2470	35 3 21	2448	33 21 2	2488	31 38 21	2423
	Regulus E.	44 1 23	2602	42 20 13	2480	40 38 39	2468	38 56 41	2461
	Saturn E.	52 30 35	2483	50 49 12	2476	49 7 25	2460	47 25 15	2443
	Spica E.	98 2 55	2492	96 21 31	2474	94 39 41	2465	92 57 24	2436
22	Mars W.	84 17 59	2569	85 57 36	2551	87 37 38	2533	89 18 5	2515
	α Arietis W.	82 3 38	2346	83 48 16	2328	85 33 20	2321	87 18 49	2304
	Aldebaran W.	49 52 57	2431	51 35 47	2410	53 19 8	2399	55 2 59	2386
	Regulus E.	30 21 0	2373	28 36 46	2369	26 52 12	2346	25 7 20	2336
	Saturn E.	38 48 45	2368	37 4 24	2355	35 19 45	2344	33 34 49	2333
	Spica E.	84 19 29	2346	82 34 37	2328	80 49 19	2311	79 3 36	2295
23	Mars W.	97 46 24	2432	99 29 13	2417	101 12 23	2403	102 55 54	2386
	α Arietis W.	96 12 15	2226	98 0 5	2210	99 48 17	2197	101 36 49	2184
	Aldebaran W.	63 49 21	2376	65 35 56	2359	67 22 56	2348	69 10 19	2329
	Pollux W.	22 2 22	2405	23 45 49	2365	25 30 14	2330	27 15 30	2298
	Spica E.	70 9 2	2216	68 20 59	2202	66 32 34	2188	64 43 48	2174
	Antares E.	115 51 19	2210	114 3 6	2196	112 14 31	2180	110 25 34	2167
24	α Arietis W.	110 44 15	2126	112 34 35	2116	114 25 10	2107	116 15 58	2099
	Aldebaran W.	78 12 31	2163	80 1 54	2153	81 51 33	2142	83 41 28	2133
	Pollux W.	36 11 43	2186	38 0 31	2170	39 49 44	2155	41 39 19	2141
	Spica E.	55 35 12	2116	53 44 38	2107	51 53 49	2098	50 2 46	2089
	Antares E.	101 15 59	2107	99 25 11	2096	97 34 8	2088	95 42 50	2079
25	Aldebaran W.	92 54 10	2099	94 45 11	2084	96 36 19	2080	98 27 33	2067
	Pollux W.	50 51 50	2091	52 43 3	2084	54 34 27	2077	56 26 1	2073
	Jupiter W.	21 34 49	2064	23 26 43	2044	25 18 53	2044	27 11 18	2035
	Spica E.	40 44 44	2090	38 52 43	2046	37 0 36	2033	35 8 25	2023
	Antares E.	86 23 15	2044	84 30 50	2040	82 38 18	2036	80 45 40	2023
26	Aldebaran W.	107 44 22	2086	109 35 42	2068	111 26 59	2092	113 18 11	2086
	Pollux W.	65 45 18	2061	67 37 18	2061	69 29 18	2061	71 21 17	2063
	Jupiter W.	36 36 1	2014	38 29 13	2013	40 22 27	2014	42 15 40	2014
	Regulus W.	28 43 13	2059	30 35 15	2037	32 27 21	2055	34 19 29	2055
	Saturn W.	21 13 36	2147	23 3 23	2128	24 53 39	2114	26 44 17	2103
	Antares E.	71 21 34	2027	69 28 42	2028	67 35 51	2020	65 43 3	2022
	α Aquilæ E.	121 22 22	2022	119 48 23	2023	118 13 46	2026	116 38 36	2026
27	Pollux W.	80 40 10	2082	82 31 37	2068	84 22 55	2065	86 14 2	2101
	Jupiter W.	51 40 57	2032	53 33 42	2037	55 26 19	2043	57 18 46	2050
	Regulus W.	43 39 43	2069	45 31 30	2074	47 23 9	2079	49 14 40	2086
	Saturn W.	36 0 18	2065	37 51 40	2068	39 43 0	2080	41 34 15	2094
	Antares E.	56 20 17	2053	54 28 6	2060	52 36 5	2066	50 44 14	2074
	α Aquilæ E.	108 36 50	2079	106 59 42	2073	105 22 25	2068	103 45 2	2066
28	Pollux W.	95 26 37	2147	97 16 25	2157	99 5 57	2168	100 55 13	2180
	Jupiter W.	66 38 6	2092	68 29 18	2102	70 20 14	2113	72 10 53	2126
	Regulus W.	58 29 21	2128	60 19 37	2128	62 9 38	2148	63 59 24	2159
	Saturn W.	50 48 32	2126	52 38 51	2135	54 28 57	2144	56 18 49	2154
	Antares E.	41 28 8	2118	39 37 37	2130	37 47 23	2140	35 57 25	2151
	α Aquilæ E.	95 38 13	2081	94 1 7	2089	92 24 12	2098	90 47 29	2098
	SUN E.	133 30 10	2441	131 47 33	2450	130 5 9	2461	128 23 1	2473

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
21	Aldebaran W.	43° 7' 8"	2037	44° 47' 44"	2009	46° 28' 55"	2478	48° 10' 39"	2484
	Jupiter E.	29 55 19	2409	28 11 57	2386	26 28 15	2381	24 44 13	2367
	Regulus E.	37 14 19	2484	35 31 33	2418	33 48 24	2403	32 4 53	2387
	Saturn E.	45 42 41	2437	43 59 45	2411	42 16 26	2396	40 32 46	2382
	Spica E.	91 14 41	2418	89 31 32	2400	87 47 57	2382	86 3 56	2364
22	Mars W.	90 58 57	2488	92 40 13	2481	94 21 53	2484	96 3 57	2448
	α Arietis W.	89 4 42	2287	90 51 0	2271	92 37 42	2286	94 24 47	2240
	Aldebaran W.	56 47 20	2246	58 32 10	2229	60 17 27	2211	62 3 11	2223
	Regulus E.	23 22 13	2337	21 36 53	2330	19 51 22	2316	18 5 46	2317
	Saturn E.	31 49 37	2324	30 4 12	2317	28 18 37	2311	26 32 54	2306
	Spica E.	77 17 29	2278	75 30 57	2262	73 44 2	2246	71 56 43	2231
23	Mars W.	104 39 46	2375	106 23 57	2362	108 8 27	2349	109 53 15	2337
	α Arietis W.	103 25 41	2170	105 14 53	2159	107 4 23	2147	108 54 11	2136
	Aldebaran W.	70 58 4	2214	72 46 11	2200	74 34 39	2187	76 23 26	2175
	Pollux W.	29 1 32	2270	30 48 15	2247	32 35 33	2235	34 23 23	2205
	Spica E.	62 54 42	2162	61 5 17	2149	59 15 33	2137	57 25 31	2126
	Antares E.	108 36 17	2164	106 46 40	2141	104 56 44	2130	103 6 30	2118
24	α Arietis W.	118 6 59	2092	119 58 11	2085	121 49 33	2079	123 41 5	2073
	Aldebaran W.	85 31 37	2134	87 21 59	2116	89 12 33	2110	91 3 17	2104
	Pollux W.	43 29 15	2129	45 19 30	2118	47 10 2	2108	49 0 49	2096
	Spica E.	48 11 30	2092	46 20 3	2075	44 28 26	2069	42 36 39	2064
	Antares E.	93 51 18	2071	91 59 34	2063	90 7 38	2056	88 15 31	2050
25	Aldebaran W.	100 18 52	2086	102 10 14	2083	104 1 37	2085	105 53 0	2086
	Pollux W.	58 17 42	2068	60 9 30	2066	62 1 23	2063	63 53 19	2061
	Jupiter W.	29 3 57	2038	30 56 48	2023	32 49 47	2019	34 42 52	2016
	Spica E.	33 16 11	2042	31 23 57	2042	29 31 44	2034	27 39 34	2027
	Antares E.	78 52 57	2030	77 0 10	2028	75 7 20	2026	73 14 27	2026
26	Aldebaran W.	115 9 17	2161	117 0 15	2107	118 51 3	2115	120 41 40	2123
	Pollux W.	73 13 13	2066	75 5 5	2069	76 56 53	2072	78 48 35	2077
	Jupiter W.	44 8 52	2016	46 2 1	2019	47 55 6	2023	49 48 5	2027
	Regulus W.	36 11 38	2066	38 3 45	2049	39 55 49	2061	41 47 49	2064
	Saturn W.	28 35 12	2095	30 26 19	2089	32 17 35	2086	34 8 55	2086
	Antares E.	63 50 18	2035	61 57 38	2029	60 5 4	2043	58 12 37	2048
	α Aquilæ E.	115 2 57	2737	113 26 53	2711	111 50 28	2698	110 13 46	2688
27	Pollux W.	88 4 59	2169	89 55 44	2118	91 46 16	2127	93 36 34	2137
	Jupiter W.	59 11 3	2047	61 3 8	2046	62 55 0	2073	64 46 40	2083
	Regulus W.	51 6 0	2094	52 57 9	2101	54 48 6	2110	56 38 50	2118
	Saturn W.	43 25 24	2096	45 16 26	2104	47 7 19	2111	48 58 1	2118
	Antares E.	48 52 35	2062	47 1 8	2080	45 9 54	2099	43 18 54	2109
	α Aquilæ E.	102 7 37	2686	100 30 11	2667	98 52 47	2670	97 15 27	2675
28	Pollux W.	102 44 11	2192	104 32 51	2204	106 21 12	2216	108 9 15	2230
	Jupiter W.	74 1 14	2136	75 51 18	2147	77 41 5	2159	79 30 35	2170
	Regulus W.	65 48 53	2170	67 38 5	2182	69 27 0	2184	71 15 37	2206
	Saturn W.	58 8 26	2164	59 57 48	2175	61 46 53	2186	63 35 41	2198
	Antares E.	34 7 44	2163	32 18 21	2178	30 29 16	2188	28 40 30	2200
	α Aquilæ E.	89 11 0	2730	87 34 47	2723	85 58 51	2748	84 23 15	2765
	SUN E.	126 41 9	2486	124 59 34	2496	123 18 15	2609	121 37 14	2623

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Fri.	1	^h 22 ^m 49 ^s 39.49	9.352	S. [°] 7 ['] 28 ["] 10.1	57.05	16 ["] 10.26	65.41	^m 12 ^s 31.82	^s 0.504	
Sat.	2	22 53 23.67	9.332	7 5 17.8	57.31	16 10.01	65.34	12 19.47	0.524	
Sun.	3	22 57 7.39	9.312	6 42 19.4	57.55	16 9.75	65.27	12 6.67	0.543	
Mon.	4	23 0 50.65	9.295	6 19 15.5	57.78	16 9.49	65.20	11 53.42	0.561	
Tues.	5	23 4 33.47	9.278	5 56 6.2	58.00	16 9.23	65.13	11 39.72	0.579	
Wed.	6	23 8 15.89	9.261	5 32 51.8	58.20	16 8.97	65.07	11 25.62	0.595	
Thur.	7	23 11 57.91	9.244	5 9 32.9	58.38	16 8.71	65.01	11 11.13	0.611	
Fri.	8	23 15 39.53	9.228	4 46 9.9	58.55	16 8.45	64.95	10 56.23	0.627	
Sat.	9	23 19 20.80	9.214	4 22 43.1	58.70	16 8.19	64.90	10 40.99	0.642	
Sun.	10	23 23 1.74	9.200	3 59 12.9	58.83	16 7.92	64.85	10 25.42	0.656	
Mon.	11	23 26 42.35	9.187	3 35 39.9	58.94	16 7.65	64.80	10 9.52	0.669	
Tues.	12	23 30 22.66	9.174	3 12 4.3	59.04	16 7.39	64.76	9 53.30	0.681	
Wed.	13	23 34 2.66	9.162	2 48 26.7	59.12	16 7.13	64.72	9 36.79	0.693	
Thur.	14	23 37 42.38	9.151	2 24 47.4	59.18	16 6.86	64.68	9 20.01	0.705	
Fri.	15	23 41 21.85	9.141	2 1 6.8	59.22	16 6.59	64.64	9 2.97	0.715	
Sat.	16	23 45 1.07	9.131	1 37 25.3	59.25	16 6.32	64.61	8 45.70	0.724	
Sun.	17	23 48 40.07	9.122	1 13 43.1	59.27	16 6.06	64.58	8 28.19	0.732	
Mon.	18	23 52 18.86	9.114	0 50 0.8	59.27	16 5.79	64.56	8 10.47	0.740	
Tues.	19	23 55 57.46	9.107	0 26 18.6	59.25	16 5.52	64.54	7 52.57	0.748	
Wed.	20	23 59 35.90	9.101	S. 0 2 36.9	59.22	16 5.25	64.52	7 34.52	0.755	
Thur.	21	0 3 14.20	9.095	N. 0 21 3.9	59.18	16 4.99	64.50	7 16.32	0.761	
Fri.	22	0 6 52.38	9.090	0 44 48.4	59.13	16 4.72	64.49	6 58.00	0.765	
Sat.	23	0 10 30.45	9.086	1 8 21.4	59.07	16 4.45	64.48	6 39.57	0.769	
Sun.	24	0 14 8.44	9.084	1 31 57.5	58.98	16 4.18	64.47	6 21.06	0.772	
Mon.	25	0 17 46.39	9.082	1 55 31.3	58.87	16 3.90	64.46	6 2.51	0.774	
Tues.	26	0 21 24.32	9.082	2 19 2.4	58.75	16 3.62	64.46	5 43.94	0.775	
Wed.	27	0 25 2.24	9.082	2 42 30.7	58.63	16 3.34	64.46	5 25.35	0.774	
Thur.	28	0 28 40.17	9.083	3 5 56.0	58.49	16 3.06	64.46	5 6.77	0.773	
Fri.	29	0 32 18.14	9.085	3 29 17.8	58.34	16 2.78	64.47	4 48.24	0.771	
Sat.	30	0 35 56.18	9.088	3 52 35.7	58.17	16 2.50	64.48	4 29.78	0.768	
Sun.	31	0 39 34.32	9.093	4 15 49.4	57.99	16 2.21	64.49	4 11.41	0.764	
Mon.	32	0 43 12.55	9.097	N. 4 38 58.5	57.79	16 1.92	64.51	3 53.14	0.759	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	D.M. for 1 hour.	Apparent Declination.	D.M. for 1 hour.			
Fri.	1	^h 22 ^m 49 ^s 37.54	9.359	S. 7° 28' 22.0"	57.05	^m 12 ^s 31.92	0.504	^h 22 ^m 37 ^s 5.62
Sat.	2	22 53 21.75	9.339	7 5 29.6	57.31	12 19.57	0.524	22 41 2.18
Sun.	3	22 57 5.50	9.312	6 42 31.1	57.55	12 6.77	0.543	22 44 58.73
Mon.	4	23 0 48.80	9.295	6 19 27.0	57.78	11 53.52	0.561	22 48 55.28
Tues.	5	23 4 31.66	9.278	5 56 17.5	58.00	11 39.82	0.579	22 52 51.84
Wed.	6	23 8 14.12	9.261	5 33 2.9	58.20	11 25.73	0.595	22 56 48.39
Thur.	7	23 11 56.18	9.244	5 9 43.8	58.38	11 11.24	0.611	23 0 44.94
Fri.	8	23 15 37.84	9.228	4 46 20.6	58.55	10 56.34	0.627	23 4 41.50
Sat.	9	23 19 19.15	9.214	4 22 53.6	58.70	10 41.10	0.642	23 8 38.05
Sun.	10	23 23 0.13	9.200	3 59 23.2	58.83	10 25.53	0.656	23 12 34.60
Mon.	11	23 26 40.78	9.187	3 35 49.9	58.94	10 19.62	0.669	23 16 31.16
Tues.	12	23 30 21.13	9.174	3 12 14.1	59.04	9 53.42	0.681	23 20 27.71
Wed.	13	23 34 1.17	9.162	2 48 36.2	59.12	9 36.91	0.693	23 24 24.26
Thur.	14	23 37 40.94	9.151	2 24 56.6	59.18	9 20.13	0.705	23 28 20.81
Fri.	15	23 41 20.46	9.141	2 1 15.7	59.22	9 3.09	0.715	23 32 17.37
Sat.	16	23 44 59.73	9.131	1 37 33.9	59.25	8 45.81	0.724	23 36 13.92
Sun.	17	23 48 38.77	9.123	1 13 51.5	59.27	8 28.30	0.732	23 40 10.47
Mon.	18	23 52 17.61	9.114	0 50 8.9	59.27	8 10.58	0.740	23 44 7.03
Tues.	19	23 55 56.26	9.107	0 26 26.4	59.25	7 52.68	0.748	23 48 3.58
Wed.	20	23 59 34.75	9.101	S. 0 2 44.4	59.22	7 34.62	0.755	23 52 0.13
Thur.	21	0 3 13.10	9.095	N. 0 20 56.7	59.18	7 16.41	0.761	23 55 56.69
Fri.	22	0 6 51.33	9.090	0 44 36.5	59.13	6 58.09	0.765	23 59 53.24
Sat.	23	0 10 29.45	9.086	1 8 14.8	59.07	6 39.66	0.769	0 3 49.79
Sun.	24	0 14 7.49	9.084	1 31 51.2	58.98	6 21.14	0.772	0 7 46.35
Mon.	25	0 17 45.48	9.082	1 55 25.3	58.87	6 2.59	0.774	0 11 42.89
Tues.	26	0 21 23.46	9.082	2 18 56.8	58.75	5 44.01	0.775	0 15 39.45
Wed.	27	0 25 1.42	9.082	2 42 25.5	58.63	5 25.42	0.774	0 19 36.00
Thur.	28	0 28 39.40	9.083	3 5 51.1	58.49	5 6.84	0.773	0 23 32.56
Fri.	29	0 32 17.42	9.085	3 29 13.2	58.34	4 48.31	0.771	0 27 29.11
Sat.	30	0 35 55.50	9.088	3 52 31.4	58.17	4 29.84	0.768	0 31 25.66
Sun.	31	0 39 33.68	9.093	4 15 45.4	57.99	4 11.46	0.764	0 35 22.22
Mon.	32	0 43 11.96	9.097	N. 4 38 54.8	57.79	3 53.19	0.759	0 39 18.77

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ch.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	60	340° 56' 13.7"	55° 48.6"	150.34	—0.72	9.9962886	46.8	1 ^h 22 ^m 40.80 ^s	
2	61	341 56 21.0	55 55.7	150.28	0.66	.9964017	47.3	1 18 44.89	
3	62	342 56 26.7	56 1.3	150.21	0.57	.9965160	47.8	1 14 48.98	
4	63	343 56 30.9	56 5.4	150.14	0.47	.9966314	48.2	1 10 53.07	
5	64	344 56 33.5	56 7.9	150.07	0.35	.9967478	48.6	1 6 57.16	
6	65	345 56 34.4	56 8.7	150.00	0.22	.9968649	48.9	1 3 1.26	
7	66	346 56 33.7	56 7.9	149.93	—0.09	.9969825	49.1	0 59 5.35	
8	67	347 56 31.3	56 5.4	149.86	+0.04	.9971006	49.2	0 55 9.44	
9	68	348 56 27.2	56 1.2	149.79	0.17	.9972191	49.3	0 51 13.53	
10	69	349 56 21.3	55 55.2	149.71	0.28	.9973379	49.4	0 47 17.62	
11	70	350 56 13.5	55 47.3	149.63	0.37	.9974568	49.5	0 43 21.72	
12	71	351 56 3.7	55 37.4	149.55	0.44	.9975758	49.6	0 39 25.81	
13	72	352 55 51.8	55 25.4	149.46	0.46	.9976948	49.6	0 35 29.90	
14	73	353 55 37.8	55 11.3	149.37	0.45	.9978139	49.7	0 31 33.99	
15	74	354 55 21.7	54 55.1	149.28	0.42	.9979332	49.7	0 27 38.09	
16	75	355 55 3.4	54 36.7	149.19	0.36	.9980526	49.8	0 23 42.19	
17	76	356 54 42.8	54 16.0	149.09	0.27	.9981722	49.9	0 19 46.28	
18	77	357 54 19.9	53 53.0	148.99	0.17	.9982920	50.0	0 15 50.37	
19	78	358 53 54.7	53 27.7	148.89	+0.06	.9984123	50.2	0 11 54.46	
20	79	359 53 27.2	53 0.1	148.80	—0.06	.9985331	50.4	0 7 58.55	
21	80	0 52 57.4	52 30.2	148.71	0.19	.9986544	50.6	0 4 2.65	
22	81	1 52 25.3	51 58.0	148.62	0.32	.9987762	50.9	23 ^h 52 ^m 14.93 ^s	
23	82	2 51 51.0	51 23.6	148.53	0.42	.9988988	51.3	23 52 14.93	
24	83	3 51 14.4	50 46.9	148.44	0.51	.9990222	51.6	23 48 19.02	
25	84	4 50 35.6	50 8.0	148.35	0.58	.9991464	51.9	23 44 23.11	
26	85	5 49 54.8	49 27.1	148.26	0.63	.9992718	52.2	23 40 27.20	
27	86	6 49 12.0	48 44.2	148.18	0.64	.9993970	52.5	23 36 31.29	
28	87	7 48 27.1	47 59.2	148.10	0.61	.9995234	52.7	23 32 35.38	
29	88	8 47 40.3	47 12.3	148.02	0.56	.9996504	52.9	23 28 39.47	
30	89	9 46 51.6	46 23.5	147.94	0.48	.9997779	53.2	23 24 43.57	
31	90	10 46 1.1	45 32.9	147.86	0.38	9.9999058	53.4	23 20 47.66	
32	91	11 45 8.8	44 40.5	147.79	—0.26	0.0000339	53.4	23 16 51.75	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI- DIAMETER		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 20.2	16' 14.6	59' 50.9	-1.63	59' 30.4	-1.75	16 ^h 28.2 ^m	2.42 ^m	19.7 ^d
2	16' 8.7	16' 2.6	59' 8.8	1.85	58' 46.3	1.89	17' 26.9	2.45	20.7
3	15' 56.5	15' 50.3	58' 23.5	1.90	58' 0.8	1.87	18' 25.5	2.42	21.7
4	15' 44.2	15' 38.3	57' 38.6	1.83	57' 17.1	1.76	19' 22.5	2.32	22.7
5	15' 32.7	15' 27.3	56' 56.4	1.68	56' 36.8	1.59	20' 16.5	2.18	23.7
6	15' 22.3	15' 17.6	56' 18.2	1.50	56' 0.8	1.40	21' 7.0	2.03	24.7
7	15' 13.2	15' 9.1	55' 44.5	1.31	55' 29.4	1.21	21' 54.0	1.89	25.7
8	15' 5.3	15' 1.8	55' 15.5	1.11	55' 2.7	1.02	22' 38.1	1.79	26.7
9	14' 58.6	14' 55.7	54' 51.0	0.93	54' 40.4	0.83	23' 20.0	1.71	27.7
10	14' 53.1	14' 50.8	54' 31.0	0.74	54' 22.6	0.65	6		28.7
11	14' 48.9	14' 47.2	54' 15.3	0.56	54' 9.2	0.46	0' 0.6	1.68	29.7
12	14' 45.9	14' 44.8	54' 4.3	0.36	54' 0.6	0.25	0' 40.9	1.69	0.9
13	14' 44.2	14' 44.0	53' 58.3	-0.12	53' 57.5	-0.00	1' 21.7	1.72	1.9
14	14' 44.2	14' 44.9	53' 58.2	+0.13	54' 0.7	+0.28	2' 3.7	1.79	2.9
15	14' 46.1	14' 47.8	54' 5.1	0.44	54' 11.4	0.61	2' 47.8	1.89	3.9
16	14' 50.0	14' 52.8	54' 19.7	0.78	54' 30.2	0.96	3' 34.4	1.99	4.9
17	14' 56.3	15' 0.4	54' 42.8	1.15	54' 57.7	1.34	4' 23.6	2.10	5.9
18	15' 5.1	15' 10.4	55' 14.9	1.52	55' 34.3	1.71	5' 15.2	2.19	6.9
19	15' 16.2	15' 22.6	55' 55.8	1.88	56' 19.4	2.05	6' 8.5	2.24	7.9
20	15' 29.6	15' 37.0	56' 44.9	2.20	57' 12.0	2.32	7' 2.5	2.25	8.9
21	15' 44.7	15' 52.6	57' 40.4	2.41	58' 9.5	2.45	7' 56.4	2.23	9.9
22	16' 0.6	16' 8.7	58' 39.0	2.45	59' 8.1	2.40	8' 49.5	2.19	10.9
23	16' 16.3	16' 23.3	59' 36.2	2.28	60' 2.4	2.10	9' 41.8	2.17	11.9
24	16' 29.8	16' 35.4	60' 26.2	1.86	60' 46.8	1.56	10' 33.8	2.18	12.9
25	16' 39.9	16' 43.3	61' 3.4	1.21	61' 15.6	+0.82	11' 26.1	2.21	13.9
26	16' 45.3	16' 45.9	61' 23.0	+0.41	61' 25.4	-0.02	12' 19.9	2.28	14.9
27	16' 45.2	16' 43.1	61' 22.7	-0.44	61' 15.0	0.84	13' 15.9	2.39	15.9
28	16' 39.8	16' 35.3	61' 2.7	1.21	60' 46.3	1.53	14' 14.5	2.49	16.9
29	16' 29.8	16' 23.6	60' 26.2	1.80	60' 3.3	2.02	15' 15.0	2.54	17.9
30	16' 16.8	16' 9.5	59' 38.2	2.17	59' 11.5	2.27	16' 15.9	2.52	18.9
31	16' 2.0	15' 54.5	58' 44.0	2.31	58' 16.3	2.31	17' 15.5	2.42	19.9
32	15' 47.0	15' 39.7	57' 48.8	-2.26	57' 22.1	-2.18	18' 11.8	2.27	20.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	14 27 22.36	2.4406	S. 19° 41' 23.1"	10.585	0	16 27 14.63	2.5188	S. 25° 15' 5.2"	3.128
1	14 29 49.26	2.4495	19 51 51.3	10.309	1	16 29 45.74	2.5192	25 18 8.5	2.973
2	14 32 16.32	2.4525	20 2 11.1	10.261	2	16 32 16.81	2.5174	25 21 2.1	2.910
3	14 34 43.56	2.4555	20 12 22.7	10.123	3	16 34 47.83	2.5166	25 23 45.8	2.648
4	14 37 10.98	2.4584	20 22 25.9	9.955	4	16 37 18.80	2.5157	25 26 19.8	2.485
5	14 39 38.57	2.4612	20 32 20.8	9.845	5	16 39 49.71	2.5145	25 28 43.9	2.330
6	14 42 6.32	2.4639	20 42 7.2	9.703	6	16 42 20.55	2.5133	25 30 58.3	2.158
7	14 44 34.24	2.4667	20 51 45.1	9.561	7	16 44 51.31	2.5121	25 33 2.8	1.995
8	14 47 2.32	2.4693	21 1 14.5	9.418	8	16 47 22.00	2.5107	25 34 57.6	1.833
9	14 49 30.56	2.4720	21 10 35.2	9.273	9	16 49 52.60	2.5093	25 36 42.6	1.668
10	14 51 58.96	2.4747	21 19 47.3	9.130	10	16 52 23.11	2.5077	25 38 17.8	1.505
11	14 54 27.52	2.4773	21 28 50.7	8.988	11	16 54 53.52	2.5060	25 39 43.3	1.345
12	14 56 56.23	2.4797	21 37 45.3	8.835	12	16 57 23.83	2.5042	25 40 59.1	1.183
13	14 59 25.08	2.4821	21 46 31.0	8.698	13	16 59 54.02	2.5023	25 42 5.2	1.021
14	15 1 54.08	2.4845	21 55 7.9	8.540	14	17 2 24.10	2.5008	25 43 1.6	0.860
15	15 4 23.22	2.4868	22 3 35.8	8.380	15	17 4 54.05	2.4991	25 43 48.4	0.700
16	15 6 52.50	2.4891	22 11 54.7	8.240	16	17 7 23.87	2.4966	25 44 25.5	0.540
17	15 9 21.91	2.4918	22 20 4.6	8.090	17	17 9 53.55	2.4956	25 44 53.1	0.380
18	15 11 51.45	2.4933	22 28 5.4	7.936	18	17 12 23.10	2.4911	25 45 11.1	0.221
19	15 14 21.11	2.4953	22 35 57.0	7.785	19	17 14 52.49	2.4896	25 45 19.6	0.061
20	15 16 50.89	2.4973	22 43 39.5	7.631	20	17 17 21.73	2.4890	25 45 18.5	0.006
21	15 19 20.79	2.4993	22 51 12.8	7.478	21	17 19 50.81	2.4883	25 45 7.9	0.255
22	15 21 50.80	2.5011	22 58 36.8	7.323	22	17 22 19.72	2.4865	25 44 47.9	0.411
23	15 24 20.92	2.5029	S. 23° 5' 51.5"	7.166	23	17 24 48.47	2.4776	S. 25° 44' 18.4"	0.571
SATURDAY 2.					MONDAY 4.				
0	15 26 51.15	2.5047	S. 23° 12' 56.8"	7.011	0	17 27 17.03	2.4745	S. 25° 43' 39.6"	0.726
1	15 29 21.48	2.5062	23 19 52.8	6.855	1	17 29 45.41	2.4713	25 42 51.4	0.581
2	15 31 51.90	2.5077	23 26 39.3	6.696	2	17 32 13.59	2.4681	25 41 53.9	1.085
3	15 34 22.41	2.5092	23 33 16.4	6.540	3	17 34 41.58	2.4649	25 40 47.1	1.190
4	15 36 53.01	2.5106	23 39 44.0	6.381	4	17 37 9.38	2.4616	25 39 31.1	1.343
5	15 39 23.69	2.5119	23 46 2.1	6.221	5	17 39 36.97	2.4581	25 38 5.8	1.496
6	15 41 54.44	2.5133	23 52 10.6	6.063	6	17 42 4.34	2.4544	25 36 31.3	1.648
7	15 44 25.27	2.5143	23 58 9.5	5.901	7	17 44 31.50	2.4506	25 34 47.8	1.800
8	15 46 56.16	2.5153	24 3 58.8	5.741	8	17 46 58.44	2.4471	25 32 55.4	1.950
9	15 49 27.11	2.5163	24 9 38.5	5.581	9	17 49 25.15	2.4433	25 30 53.8	2.101
10	15 51 58.12	2.5173	24 15 8.5	5.420	10	17 51 51.63	2.4394	25 28 43.2	2.251
11	15 54 29.17	2.5179	24 20 28.9	5.258	11	17 54 17.88	2.4356	25 26 23.7	2.396
12	15 57 0.27	2.5186	24 25 39.5	5.096	12	17 56 43.88	2.4319	25 23 55.3	2.546
13	15 59 31.40	2.5192	24 30 40.4	4.935	13	17 59 9.63	2.4271	25 21 18.0	2.693
14	16 2 2.57	2.5197	24 35 31.6	4.773	14	18 1 35.13	2.4223	25 18 32.0	2.833
15	16 4 33.76	2.5200	24 40 13.0	4.610	15	18 4 0.38	2.4187	25 15 37.2	2.985
16	16 7 4.97	2.5203	24 44 44.7	4.448	16	18 6 25.37	2.4148	25 12 33.8	3.136
17	16 9 36.19	2.5206	24 49 6.6	4.283	17	18 8 50.09	2.4099	25 9 21.7	3.273
18	16 12 7.43	2.5206	24 53 18.7	4.120	18	18 11 14.54	2.4053	25 6 1.0	3.415
19	16 14 38.66	2.5205	24 57 21.0	3.962	19	18 13 38.72	2.4007	25 2 31.8	3.556
20	16 17 9.89	2.5204	25 1 13.5	3.793	20	18 16 2.63	2.3960	24 58 54.2	3.696
21	16 19 41.11	2.5202	25 4 56.2	3.630	21	18 18 26.25	2.3913	24 55 8.1	3.836
22	16 22 12.31	2.5198	25 8 29.0	3.465	22	18 20 49.59	2.3866	24 51 13.7	3.975
23	16 24 43.48	2.5193	25 11 52.0	3.301	23	18 23 12.64	2.3819	24 47 11.0	4.113
24	16 27 14.63	2.5188	S. 25° 15' 5.2"	3.138	24	18 25 35.40	2.3769	S. 24° 43' 0.0"	4.250

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	18 25 35.40	2.3709	S. 24° 43' 0.0	4.380	0	20 13 24.19	2.1110	S. 19° 1' 42.1	9.538
1	18 27 57.86	2.3719	24 38 40.9	4.386	1	20 15 30.68	2.1065	18 52 7.3	9.620
2	18 30 20.03	2.3699	24 34 13.6	4.421	2	20 17 36.85	2.1001	18 42 27.6	9.701
3	18 32 41.89	2.3618	24 29 38.3	4.655	3	20 19 42.69	2.0947	18 32 43.0	9.781
4	18 35 3.45	2.3567	24 24 54.9	4.798	4	20 21 48.21	2.0898	18 22 53.7	9.861
5	18 37 24.70	2.3516	24 20 03.7	4.920	5	20 23 53.40	2.0849	18 12 59.6	9.940
6	18 39 45.64	2.3464	24 15 4.5	5.061	6	20 25 58.27	2.0798	18 3 0.9	10.016
7	18 42 6.27	2.3413	24 9 57.5	5.180	7	20 28 2.83	2.0748	17 52 57.6	10.091
8	18 44 26.59	2.3360	24 4 42.8	5.308	8	20 30 7.06	2.0699	17 42 49.8	10.166
9	18 46 46.59	2.3306	23 59 20.4	5.436	9	20 32 10.98	2.0647	17 32 37.5	10.241
10	18 49 6.26	2.3252	23 53 50.4	5.563	10	20 34 14.58	2.0595	17 22 20.8	10.318
11	18 51 25.61	2.3198	23 48 12.8	5.689	11	20 36 17.88	2.0543	17 11 59.8	10.395
12	18 53 44.64	2.3144	23 42 27.7	5.818	12	20 38 20.86	2.0491	17 1 34.6	10.468
13	18 56 3.34	2.3089	23 36 35.2	5.945	13	20 40 23.54	2.0431	16 51 5.2	10.538
14	18 58 21.71	2.3034	23 30 35.3	6.069	14	20 42 25.91	2.0371	16 40 31.7	10.601
15	19 0 39.75	2.2979	23 24 28.2	6.178	15	20 44 27.99	2.0321	16 29 54.1	10.660
16	19 2 57.46	2.2923	23 18 13.8	6.296	16	20 46 29.76	2.0270	16 19 12.5	10.735
17	19 5 14.83	2.2867	23 11 52.2	6.418	17	20 48 31.23	2.0221	16 18 27.0	10.796
18	19 7 31.87	2.2812	23 5 23.6	6.536	18	20 50 32.41	2.0173	16 17 37.6	10.865
19	19 9 48.57	2.2756	22 58 47.9	6.651	19	20 52 33.30	2.0124	16 6 44.4	10.916
20	19 12 4.93	2.2699	22 52 5.3	6.766	20	20 54 33.90	2.0076	15 55 47.5	10.978
21	19 14 20.95	2.2643	22 45 15.8	6.881	21	20 56 34.21	2.0028	15 24 46.9	11.040
22	19 16 36.63	2.2586	22 38 19.4	6.996	22	20 58 34.24	1.9981	15 13 42.7	11.100
23	19 18 51.97	2.2528	S. 22° 31' 16.3	7.106	23	21 0 33.96	1.9934	S. 15° 2' 34.9	11.158
WEDNESDAY 6.					FRIDAY 8.				
0	19 21 6.97	2.2479	S. 22° 24' 6.5	7.219	0	21 2 33.45	1.9886	S. 14° 51' 23.6	11.216
1	19 23 21.63	2.2414	22 16 50.1	7.338	1	21 4 32.64	1.9843	14 40 8.9	11.273
2	19 25 35.94	2.2357	22 9 27.1	7.456	2	21 6 31.56	1.9797	14 28 50.8	11.336
3	19 27 49.91	2.2300	22 1 57.6	7.565	3	21 8 30.21	1.9752	14 17 29.4	11.388
4	19 30 3.54	2.2243	21 54 21.7	7.661	4	21 10 28.59	1.9708	14 6 4.8	11.436
5	19 32 16.82	2.2186	21 46 39.4	7.766	5	21 12 26.71	1.9664	13 54 37.0	11.480
6	19 34 29.76	2.2129	21 38 50.9	7.860	6	21 14 24.56	1.9621	13 43 6.0	11.541
7	19 36 42.35	2.2070	21 30 56.2	7.963	7	21 16 22.16	1.9578	13 31 31.9	11.593
8	19 38 54.60	2.2013	21 22 55.3	8.065	8	21 18 19.50	1.9535	13 19 54.8	11.643
9	19 41 6.51	2.1956	21 14 48.4	8.165	9	21 20 16.58	1.9493	13 8 14.7	11.691
10	19 43 18.07	2.1898	21 6 35.5	8.265	10	21 22 13.42	1.9450	12 56 31.8	11.738
11	19 45 29.29	2.1841	20 58 16.6	8.363	11	21 24 10.01	1.9413	12 44 46.0	11.785
12	19 47 40.16	2.1783	20 49 51.9	8.460	12	21 26 6.36	1.9373	12 32 57.5	11.831
13	19 49 50.69	2.1727	20 41 21.4	8.557	13	21 28 2.47	1.9333	12 21 6.2	11.876
14	19 52 0.88	2.1670	20 32 45.1	8.652	14	21 29 58.24	1.9292	12 9 12.3	11.920
15	19 54 10.73	2.1613	20 24 3.2	8.746	15	21 31 53.97	1.9253	11 57 15.7	11.963
16	19 56 20.24	2.1557	20 15 15.6	8.838	16	21 33 49.38	1.9216	11 45 16.6	12.006
17	19 58 29.41	2.1500	20 6 22.5	8.930	17	21 35 44.56	1.9178	11 33 15.0	12.046
18	20 0 38.24	2.1443	19 57 24.0	9.020	18	21 37 39.51	1.9140	11 21 11.0	12.088
19	20 2 46.73	2.1387	19 48 20.0	9.110	19	21 39 34.24	1.9103	11 9 4.6	12.133
20	20 4 54.89	2.1332	19 39 10.8	9.196	20	21 41 28.75	1.9067	10 56 55.9	12.168
21	20 7 2.71	2.1276	19 29 56.3	9.283	21	21 43 23.05	1.9032	10 44 44.9	12.201
22	20 9 10.20	2.1221	19 20 36.7	9.370	22	21 45 17.14	1.8997	10 32 31.7	12.238
23	20 11 17.36	2.1166	19 11 11.9	9.456	23	21 47 11.02	1.8963	10 20 16.3	12.273
24	20 13 24.19	2.1110	S. 19° 1' 42.1	9.538	24	21 49 4.69	1.8928	S. 10° 7' 58.9	12.306

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	21 49 4.69	1.8998	S. 10° 7' 58.9	12.306	0	23 17 7.71	1.7992	N. 0° 6' 18.9	12.973
1	21 50 58.16	1.8996	9 55 39.4	12.341	1	23 18 55.58	1.7977	0 19 17.1	12.986
2	21 52 51.43	1.8993	9 43 17.9	12.375	2	23 20 43.43	1.7972	0 32 15.0	12.991
3	21 54 44.51	1.8991	9 30 54.4	12.406	3	23 22 31.24	1.7967	0 45 12.5	12.993
4	21 56 37.40	1.8790	9 18 29.1	12.436	4	23 24 19.03	1.7963	0 58 9.5	12.946
5	21 58 30.10	1.8788	9 6 1.9	12.466	5	23 26 6.80	1.7958	1 11 6.1	12.986
6	22 0 22.62	1.8787	8 53 32.9	12.497	6	23 27 54.55	1.7957	1 24 2.1	12.928
7	22 2 14.95	1.8707	8 41 2.2	12.525	7	23 29 42.29	1.7955	1 36 57.5	12.918
8	22 4 7.11	1.8679	8 28 29.9	12.551	8	23 31 30.01	1.7953	1 49 52.3	12.906
9	22 5 59.10	1.8660	8 15 55.9	12.580	9	23 33 17.73	1.7952	2 2 46.4	12.906
10	22 7 50.91	1.8652	8 3 20.3	12.605	10	23 35 5.44	1.7950	2 15 39.8	12.903
11	22 9 42.56	1.8644	7 50 43.2	12.630	11	23 36 53.15	1.7949	2 28 32.4	12.971
12	22 11 34.04	1.8647	7 38 4.7	12.655	12	23 38 40.87	1.7948	2 41 24.3	12.966
13	22 13 25.36	1.8641	7 25 24.7	12.676	13	23 40 28.59	1.7944	2 54 15.3	12.943
14	22 15 16.53	1.8615	7 12 43.4	12.696	14	23 42 16.32	1.7940	3 7 5.4	12.926
15	22 17 7.54	1.8499	7 0 0.8	12.730	15	23 44 4.07	1.7939	3 19 54.5	12.910
16	22 18 58.40	1.8466	6 47 16.9	12.741	16	23 45 51.83	1.7932	3 32 42.7	12.796
17	22 20 49.12	1.8441	6 34 31.8	12.761	17	23 47 39.61	1.7935	3 45 29.9	12.775
18	22 22 39.69	1.8417	6 21 45.6	12.780	18	23 49 27.41	1.7930	3 58 16.0	12.760
19	22 24 30.12	1.8394	6 8 58.2	12.796	19	23 51 15.24	1.7974	4 11 1.0	12.740
20	22 26 20.42	1.8373	5 56 9.8	12.815	20	23 53 3.10	1.7970	4 23 44.8	12.730
21	22 28 10.58	1.8340	5 43 20.4	12.831	21	23 54 50.99	1.7965	4 36 27.4	12.700
22	22 30 0.62	1.8329	5 30 30.0	12.848	22	23 56 38.92	1.7961	4 49 8.8	12.680
23	22 31 50.53	1.8306	S. 5 17 38.7	12.861	23	23 58 26.89	1.7956	N. 5 1 48.9	12.686
SUNDAY 10.					TUESDAY 12.				
0	22 33 40.32	1.8288	S. 5 4 46.6	12.875	0	0 0 14.90	1.8006	N. 5 14 27.7	12.681
1	22 35 29.99	1.8268	4 51 53.6	12.886	1	0 2 2.96	1.8014	5 27 5.1	12.611
2	22 37 19.54	1.8249	4 38 59.9	12.900	2	0 3 51.07	1.8022	5 39 41.1	12.606
3	22 39 8.98	1.8232	4 26 5.5	12.911	3	0 5 39.23	1.8031	5 52 15.6	12.593
4	22 40 58.32	1.8214	4 13 10.4	12.923	4	0 7 27.44	1.8040	6 4 48.6	12.586
5	22 42 47.55	1.8197	4 0 14.7	12.933	5	0 9 15.71	1.8051	6 17 20.1	12.571
6	22 44 36.68	1.8180	3 47 18.4	12.941	6	0 11 4.05	1.8062	6 29 50.0	12.485
7	22 46 25.71	1.8164	3 34 21.6	12.950	7	0 12 52.45	1.8073	6 42 18.2	12.456
8	22 48 14.65	1.8149	3 21 24.3	12.958	8	0 14 40.92	1.8084	6 54 44.8	12.420
9	22 50 3.50	1.8134	3 8 26.6	12.965	9	0 16 29.46	1.8097	7 7 9.7	12.400
10	22 51 52.26	1.8119	2 55 28.5	12.971	10	0 18 18.08	1.8109	7 19 32.8	12.376
11	22 53 40.98	1.8106	2 42 30.0	12.976	11	0 20 6.77	1.8126	7 31 54.1	12.340
12	22 55 29.53	1.8096	2 29 31.3	12.980	12	0 21 55.55	1.8137	7 44 13.5	12.306
13	22 57 18.05	1.8081	2 16 32.3	12.983	13	0 23 44.41	1.8151	7 56 31.1	12.276
14	22 59 6.50	1.8069	2 13 33.2	12.986	14	0 25 33.36	1.8166	8 8 46.7	12.243
15	23 0 54.88	1.8056	2 0 33.8	12.990	15	0 27 22.40	1.8181	8 21 0.3	12.210
16	23 2 43.19	1.8047	1 37 34.4	12.990	16	0 29 11.54	1.8197	8 33 11.9	12.176
17	23 4 31.44	1.8037	1 24 35.0	12.990	17	0 31 0.77	1.8213	8 45 21.5	12.141
18	23 6 19.63	1.8027	1 11 35.5	12.991	18	0 32 50.10	1.8230	8 57 28.9	12.106
19	23 8 7.76	1.8016	0 58 36.1	12.990	19	0 34 39.53	1.8246	9 9 34.2	12.070
20	23 9 55.84	1.8009	0 45 36.7	12.998	20	0 36 29.07	1.8263	9 21 37.3	12.036
21	23 11 43.87	1.8002	0 32 37.5	12.995	21	0 38 18.72	1.8284	9 33 38.1	11.996
22	23 13 31.86	1.7994	0 19 38.5	12.991	22	0 40 8.48	1.8306	9 45 36.7	11.966
23	23 15 19.80	1.7986	S. 0 6 39.7	12.978	23	0 41 58.36	1.8323	9 57 32.9	11.916
24	23 17 7.71	1.7982	N. 0 6 18.9	12.973	24	0 43 48.35	1.8341	N. 10 9 26.8	11.876

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	0 43 48.35	1.3343	N.10° 9' 26.8"	11.978	0	2 15 0.20	1.3810	N.18° 39' 31.0"	9.083
1	0 45 38.47	1.3392	10 21 18.2	11.386	1	2 16 59.28	1.3848	18 48 33.9	9.099
2	0 47 28.71	1.3438	10 33 7.2	11.796	2	2 18 58.49	1.3888	18 57 32.1	9.123
3	0 49 19.07	1.3486	10 44 53.7	11.763	3	2 20 57.94	1.3927	19 6 25.7	9.153
4	0 51 9.57	1.3527	10 56 37.6	11.710	4	2 22 57.62	1.3967	19 15 14.5	9.176
5	0 53 0.20	1.3549	11 8 18.9	11.686	5	2 24 57.54	1.3997	19 23 58.6	9.203
6	0 54 50.96	1.3573	11 19 57.6	11.623	6	2 26 57.71	1.4027	19 32 37.8	9.215
7	0 56 41.86	1.3598	11 31 33.6	11.578	7	2 28 58.11	1.4057	19 41 12.2	9.231
8	0 58 32.91	1.3620	11 43 6.9	11.551	8	2 30 58.76	1.4086	19 49 41.6	9.246
9	1 0 24.10	1.3644	11 54 37.4	11.485	9	2 32 59.65	1.4109	19 58 6.9	9.265
10	1 2 15.44	1.3668	12 6 5.1	11.436	10	2 35 0.79	1.4130	20 6 25.4	9.288
11	1 4 6.92	1.3689	12 17 29.9	11.399	11	2 37 2.17	1.4151	20 14 39.8	9.196
12	1 5 58.56	1.3619	12 28 51.9	11.341	12	2 39 3.80	1.4169	20 22 49.0	9.111
13	1 7 50.35	1.3645	12 40 10.9	11.291	13	2 41 5.68	1.4184	20 30 53.1	9.028
14	1 9 42.30	1.3672	12 51 26.9	11.241	14	2 43 7.81	1.4196	20 38 51.9	7.986
15	1 11 34.41	1.3698	13 2 39.9	11.191	15	2 45 10.19	1.4218	20 46 45.5	7.946
16	1 13 26.69	1.3727	13 13 49.8	11.140	16	2 47 12.82	1.4249	20 54 33.8	7.901
17	1 15 19.13	1.3754	13 24 56.6	11.086	17	2 49 15.70	1.4260	21 2 16.8	7.871
18	1 17 11.74	1.3782	13 36 0.2	11.033	18	2 51 18.83	1.4263	21 9 54.4	7.860
19	1 19 4.52	1.3812	13 47 0.6	10.980	19	2 53 22.21	1.4268	21 17 26.5	7.461
20	1 20 57.48	1.3841	13 57 57.7	10.926	20	2 55 25.85	1.4277	21 24 53.2	7.366
21	1 22 50.61	1.3871	14 8 51.5	10.870	21	2 57 29.74	1.4289	21 32 14.3	7.366
22	1 24 43.93	1.3901	14 19 42.0	10.813	22	2 59 33.88	1.4313	21 39 29.9	7.321
23	1 26 37.42	1.3931	N.14° 30' 29.1"	10.766	23	3 1 38.28	1.4344	N.21° 46' 39.8"	7.136
THURSDAY 14.					SATURDAY 16.				
0	1 28 31.10	1.3962	N.14° 41' 12.8"	10.700	0	3 3 42.93	1.4377	N.21° 53' 44.0"	7.088
1	1 30 24.97	1.3993	14 51 53.0	10.686	1	3 5 47.84	1.4398	22 0 42.5	6.996
2	1 32 19.02	1.4024	15 2 29.6	10.661	2	3 7 53.00	1.4431	22 7 35.2	6.936
3	1 34 13.26	1.4057	15 13 2.7	10.628	3	3 9 58.41	1.4462	22 14 22.1	6.736
4	1 36 7.70	1.4089	15 23 32.2	10.486	4	3 12 4.08	1.4493	22 21 3.2	6.686
5	1 38 2.33	1.4122	15 33 57.9	10.400	5	3 14 10.00	1.4526	22 27 38.3	6.685
6	1 39 57.16	1.4156	15 44 20.0	10.386	6	3 16 16.18	1.4562	22 34 7.4	6.486
7	1 41 52.19	1.4188	15 54 38.3	10.375	7	3 18 22.62	1.4598	22 40 30.6	6.333
8	1 43 47.42	1.4222	16 4 52.9	10.310	8	3 20 29.30	1.4635	22 46 47.7	6.286
9	1 45 42.86	1.4257	16 15 3.6	10.146	9	3 22 36.24	1.4672	22 52 58.7	6.130
10	1 47 38.50	1.4291	16 25 10.4	10.078	10	3 24 43.43	1.4710	22 59 3.5	6.080
11	1 49 34.35	1.4326	16 35 13.2	10.010	11	3 26 50.88	1.4748	23 5 2.2	6.026
12	1 51 30.41	1.4361	16 45 12.1	9.943	12	3 28 58.57	1.4786	23 10 54.6	5.890
13	1 53 26.68	1.4397	16 55 7.0	9.983	13	3 31 6.52	1.4826	23 16 40.7	5.715
14	1 55 23.17	1.4433	17 4 57.8	9.810	14	3 33 14.71	1.4867	23 22 20.5	5.611
15	1 57 19.88	1.4469	17 14 44.4	9.743	15	3 35 23.16	1.4908	23 27 54.0	5.503
16	1 59 16.80	1.4506	17 24 26.9	9.673	16	3 37 31.85	1.4949	23 33 21.0	5.396
17	2 1 13.95	1.4543	17 34 5.2	9.601	17	3 39 40.79	1.4991	23 38 41.5	5.288
18	2 3 11.32	1.4580	17 43 39.2	9.581	18	3 41 49.98	1.5032	23 43 55.5	5.178
19	2 5 8.91	1.4618	17 53 8.9	9.466	19	3 43 59.41	1.5073	23 49 2.9	5.070
20	2 7 6.73	1.4656	18 2 34.2	9.395	20	3 46 9.09	1.5113	23 54 3.8	4.968
21	2 9 4.78	1.4693	18 11 55.1	9.311	21	3 48 19.01	1.5153	23 58 58.0	4.946
22	2 11 3.05	1.4732	18 21 11.6	9.286	22	3 50 29.17	1.5193	24 3 45.5	4.798
23	2 13 1.56	1.4771	18 30 23.6	9.160	23	3 52 39.57	1.5233	24 8 26.3	4.688
24	2 15 0.20	1.4810	N.18° 39' 31.0"	9.083	24	3 54 50.21	1.5273	N.24° 13' 0.3"	4.510

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 54 50.21	2.1798	N.24 13 0.3	4.510	0	5 43 15.94	2.3189	N.25 26 58.7	1.680
1	3 57 1.09	2.1832	24 17 27.5	4.506	1	5 45 35.12	2.3204	25 25 16.7	1.708
2	3 59 12.20	2.1871	24 21 47.9	4.501	2	5 47 54.39	2.3219	25 23 26.4	1.907
3	4 1 23.54	2.1910	24 26 1.3	4.495	3	5 50 13.75	2.3233	25 21 27.8	2.046
4	4 3 35.12	2.1949	24 30 7.8	4.490	4	5 52 33.19	2.3247	25 19 20.9	2.186
5	4 5 46.93	2.1987	24 34 7.3	4.505	5	5 54 52.71	2.3260	25 17 5.6	2.326
6	4 7 58.96	2.2024	24 37 59.8	4.516	6	5 57 12.30	2.3271	25 14 41.9	2.464
7	4 10 11.22	2.2062	24 41 45.2	4.506	7	5 59 31.96	2.3283	25 12 9.9	2.603
8	4 12 23.71	2.2100	24 45 23.5	4.509	8	6 1 51.68	2.3293	25 9 29.5	2.743
9	4 14 36.42	2.2137	24 48 54.7	4.500	9	6 4 11.47	2.3303	25 6 40.7	2.882
10	4 16 49.35	2.2173	24 52 18.7	4.540	10	6 6 31.31	2.3311	25 3 43.5	3.023
11	4 19 2.50	2.2209	24 55 35.5	4.519	11	6 8 51.20	2.3320	25 0 37.9	3.163
12	4 21 15.86	2.2244	24 58 45.0	4.507	12	6 11 11.15	2.3328	24 57 23.9	3.303
13	4 23 29.43	2.2280	25 1 47.2	4.506	13	6 13 31.14	2.3336	24 54 1.5	3.444
14	4 25 43.22	2.2315	25 4 42.1	4.503	14	6 15 51.18	2.3345	24 50 30.6	3.584
15	4 27 57.21	2.2349	25 7 29.5	4.507	15	6 18 11.25	2.3348	24 46 51.4	3.734
16	4 30 11.41	2.2383	25 10 9.6	4.506	16	6 20 31.36	2.3354	24 43 3.7	3.884
17	4 32 25.81	2.2417	25 12 42.1	4.480	17	6 22 51.50	2.3360	24 39 7.5	4.036
18	4 34 40.42	2.2451	25 15 7.2	4.545	18	6 25 11.66	2.3363	24 35 2.9	4.186
19	4 36 55.22	2.2485	25 17 24.7	4.529	19	6 27 31.85	2.3367	24 30 49.9	4.336
20	4 39 10.21	2.2516	25 19 34.7	4.503	20	6 29 52.06	2.3370	24 26 28.5	4.486
21	4 41 25.40	2.2547	25 21 37.1	4.506	21	6 32 12.29	2.3373	24 21 58.7	4.636
22	4 43 40.77	2.2578	25 23 31.8	4.548	22	6 34 32.53	2.3374	24 17 20.4	4.787
23	4 45 56.33	2.2608	N.25 25 18.9	4.530	23	6 36 52.78	2.3370	N.24 12 33.8	4.937
MONDAY 18.					WEDNESDAY 20.				
0	4 48 12.07	2.2638	N.25 26 58.3	4.591	0	6 39 13.03	2.3375	N.24 7 38.7	4.988
1	4 50 27.99	2.2668	25 28 29.9	4.602	1	6 41 33.28	2.3375	24 2 35.2	5.138
2	4 52 44.09	2.2697	25 29 53.8	4.593	2	6 43 53.53	2.3375	23 57 23.2	5.288
3	4 55 0.36	2.2726	25 31 9.9	4.593	3	6 46 13.78	2.3375	23 52 3.0	5.438
4	4 57 16.80	2.2754	25 32 18.2	4.602	4	6 48 34.03	2.3373	23 46 34.7	5.588
5	4 59 33.41	2.2782	25 33 18.6	4.642	5	6 50 54.28	2.3371	23 40 57.8	5.738
6	5 1 50.18	2.2809	25 34 11.1	4.609	6	6 53 14.48	2.3368	23 35 12.5	5.888
7	5 4 7.12	2.2836	25 34 55.7	4.606	7	6 55 34.68	2.3365	23 29 18.9	6.038
8	5 6 24.21	2.2861	25 35 32.3	4.644	8	6 57 54.86	2.3363	23 23 17.0	6.188
9	5 8 41.45	2.2886	25 36 1.0	4.611	9	7 0 15.02	2.3367	23 17 6.7	6.338
10	5 10 58.84	2.2911	25 36 21.7	4.578	10	7 2 35.15	2.3365	23 10 48.2	6.487
11	5 13 16.38	2.2935	25 36 34.4	4.614	11	7 4 55.25	2.3363	23 4 21.4	6.637
12	5 15 34.06	2.2959	25 36 39.0	4.600	12	7 7 15.32	2.3363	22 57 46.4	6.787
13	5 17 51.88	2.2981	25 36 35.5	4.635	13	7 9 35.35	2.3360	22 51 3.1	6.937
14	5 20 9.83	2.2993	25 36 24.0	4.620	14	7 11 55.35	2.3359	22 44 11.6	7.087
15	5 22 27.92	2.3026	25 36 4.3	4.606	15	7 14 15.30	2.3353	22 37 11.9	7.237
16	5 24 46.13	2.3046	25 35 36.5	4.631	16	7 16 35.21	2.3351	22 30 4.0	7.387
17	5 27 4.47	2.3066	25 35 0.5	4.667	17	7 18 55.08	2.3357	22 22 48.0	7.537
18	5 29 22.92	2.3085	25 34 16.4	4.604	18	7 21 14.90	2.3350	22 15 23.8	7.687
19	5 31 41.49	2.3104	25 33 24.0	4.641	19	7 23 34.66	2.3350	22 7 51.6	7.837
20	5 34 0.17	2.3123	25 32 23.5	4.677	20	7 25 54.38	2.3353	22 0 11.3	7.987
21	5 36 18.96	2.3140	25 31 14.7	4.713	21	7 28 14.04	2.3373	21 52 23.0	8.137
22	5 38 37.85	2.3167	25 29 57.7	4.749	22	7 30 33.64	2.3362	21 44 26.6	8.287
23	5 40 56.85	2.3174	25 28 32.4	4.690	23	7 32 53.19	2.3362	21 36 22.3	8.437
24	5 43 15.94	2.3189	N.25 26 58.7	4.630	24	7 35 12.67	2.3363	N.21 28 10.0	8.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	7 35 12.67	2.2343	N.21° 26' 10.0"	8.370	0	9 25 17.95	2.2685	N.12° 31' 55.7"	13.726
1	7 37 32.09	2.2321	21 19 49.8	8.403	1	9 27 33.73	2.2626	12 18 9.4	13.816
2	7 39 51.44	2.2300	21 11 21.6	8.535	2	9 29 49.46	2.2617	12 4 17.8	13.903
3	7 42 10.73	2.2300	21 2 45.6	8.665	3	9 32 5.13	2.2606	11 50 21.1	13.988
4	7 44 29.95	2.2108	20 54 1.8	8.795	4	9 34 20.76	2.2606	11 36 19.2	14.073
5	7 46 49.10	2.2106	20 45 10.2	8.924	5	9 36 36.33	2.2601	11 22 12.3	14.158
6	7 49 8.18	2.2174	20 36 10.8	9.054	6	9 38 51.85	2.2603	11 8 0.4	14.239
7	7 51 27.19	2.2102	20 27 3.7	9.182	7	9 41 7.33	2.2677	10 53 43.6	14.319
8	7 53 46.12	2.2140	20 17 48.9	9.310	8	9 43 22.77	2.2670	10 39 22.1	14.398
9	7 56 4.98	2.2137	20 8 26.4	9.438	9	9 45 28.17	2.2608	10 24 55.8	14.475
10	7 58 23.76	2.2133	19 58 56.3	9.564	10	9 47 53.52	2.2587	10 10 25.0	14.551
11	8 0 42.46	2.2111	19 49 18.7	9.690	11	9 50 8.85	2.2662	9 55 49.6	14.627
12	8 3 1.09	2.2008	19 39 33.5	9.815	12	9 52 24.14	2.2646	9 41 9.8	14.700
13	8 5 19.63	2.2004	19 29 40.8	9.940	13	9 54 39.40	2.2641	9 26 25.6	14.772
14	8 7 38.10	2.2071	19 19 40.7	10.061	14	9 56 54.63	2.2587	9 11 37.1	14.848
15	8 9 56.48	2.2056	19 9 33.2	10.187	15	9 59 9.84	2.2580	8 56 44.4	14.913
16	8 12 14.79	2.2045	18 59 18.4	10.308	16	10 1 25.03	2.2580	8 41 47.5	14.981
17	8 14 33.02	2.2031	18 48 56.2	10.430	17	10 3 40.20	2.2527	8 26 46.6	15.047
18	8 16 51.16	2.2017	18 38 26.8	10.550	18	10 5 55.35	2.2594	8 11 41.8	15.111
19	8 19 9.22	2.2003	18 27 50.1	10.670	19	10 8 10.49	2.2592	7 56 33.2	15.176
20	8 21 27.20	2.2000	18 17 6.3	10.787	20	10 10 25.62	2.2521	7 41 20.8	15.237
21	8 23 45.09	2.2075	18 6 15.4	10.907	21	10 12 40.74	2.2620	7 26 4.7	15.297
22	8 26 2.90	2.2092	17 55 17.4	11.025	22	10 14 55.86	2.2620	7 10 45.1	15.355
23	8 28 20.63	2.2049	N.17 44 12.3	11.143	23	10 17 10.98	2.2620	N. 6 55 22.0	15.413
FRIDAY 22.					SUNDAY 24.				
0	8 30 38.27	2.2033	N.17 33 0.3	11.260	0	10 19 26.10	2.2621	N. 6 39 55.4	15.470
1	8 32 55.83	2.2019	17 21 41.4	11.373	1	10 21 41.23	2.2623	6 24 25.5	15.524
2	8 35 13.30	2.2006	17 10 15.7	11.485	2	10 23 56.36	2.2623	6 8 52.5	15.575
3	8 37 30.69	2.2002	16 58 43.1	11.599	3	10 26 11.51	2.2626	5 53 16.4	15.627
4	8 39 48.00	2.2076	16 47 3.8	11.710	4	10 28 26.67	2.2626	5 37 37.2	15.677
5	8 42 5.23	2.2064	16 35 17.8	11.822	5	10 30 41.85	2.2632	5 21 55.1	15.726
6	8 44 22.37	2.2060	16 23 25.1	11.932	6	10 32 57.06	2.2637	5 6 10.2	15.771
7	8 46 39.43	2.2037	16 11 25.9	12.040	7	10 35 12.29	2.2641	4 50 22.5	15.815
8	8 48 56.41	2.2023	15 59 20.2	12.148	8	10 37 27.55	2.2646	4 34 32.3	15.857
9	8 51 13.31	2.2010	15 47 8.0	12.255	9	10 39 42.84	2.2642	4 18 39.6	15.898
10	8 53 30.13	2.2707	15 34 49.5	12.361	10	10 41 58.17	2.2658	4 2 44.5	15.937
11	8 55 46.87	2.2704	15 22 24.6	12.467	11	10 44 13.53	2.2664	3 46 47.1	15.975
12	8 58 3.54	2.2772	15 9 53.4	12.570	12	10 46 28.94	2.2672	3 30 47.5	16.010
13	9 0 20.13	2.2768	14 57 16.1	12.673	13	10 48 44.39	2.2680	3 14 45.9	16.042
14	9 2 36.64	2.2746	14 44 32.6	12.775	14	10 50 59.90	2.2680	2 58 42.4	16.074
15	9 4 53.08	2.2784	14 31 43.1	12.875	15	10 53 15.46	2.2686	2 42 37.0	16.104
16	9 7 9.45	2.2792	14 18 47.5	12.975	16	10 55 31.07	2.2607	2 26 29.9	16.131
17	9 9 25.74	2.2710	14 5 46.0	13.073	17	10 57 46.75	2.2616	2 10 21.2	16.158
18	9 11 41.97	2.2699	13 52 36.7	13.170	18	11 0 2.49	2.2626	1 54 10.9	16.182
19	9 13 58.13	2.2686	13 39 25.6	13.266	19	11 2 18.29	2.2640	1 37 59.3	16.206
20	9 16 14.22	2.2677	13 26 6.7	13.361	20	11 4 34.17	2.2662	1 21 46.3	16.226
21	9 18 30.25	2.2666	13 12 42.2	13.455	21	11 6 50.12	2.2665	1 5 32.1	16.245
22	9 20 46.21	2.2656	12 59 12.2	13.548	22	11 9 6.15	2.2676	0 49 16.8	16.262
23	9 23 2.11	2.2645	12 45 36.7	13.637	23	11 11 22.26	2.2692	0 33 0.6	16.277
24	9 25 17.95	2.2635	N.12 31 55.7	13.733	24	11 13 38.46	2.2707	N. 0 16 43.5	16.291

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	11 13 38.46	2.3707	N. 0 16 43.5	16.391	0	13 5 25.37	2.4064	S. 12° 23' 30.5	14.806
1	11 15 54.75	2.3732	N. 0 0 25.6	16.303	1	13 7 49.87	2.4102	12 38 4.5	14.822
2	11 18 11.13	2.3737	S. 0 15 52.9	16.312	2	13 10 14.60	2.4142	12 52 33.3	14.837
3	11 20 27.60	2.3754	0 32 11.9	16.320	3	13 12 39.57	2.4182	13 6 56.9	14.847
4	11 22 44.18	2.3772	0 48 31.4	16.325	4	13 15 4.78	2.4231	13 21 15.0	14.856
5	11 25 0.86	2.3789	1 4 51.2	16.331	5	13 17 30.22	2.4280	13 35 27.7	14.864
6	11 27 17.65	2.3807	1 21 11.2	16.333	6	13 19 55.90	2.4300	13 49 34.7	14.869
7	11 29 34.55	2.3826	1 37 31.2	16.333	7	13 22 21.82	2.4340	14 3 36.0	13.973
8	11 31 51.56	2.3845	1 53 51.2	16.331	8	13 24 47.98	2.4380	14 17 31.4	13.974
9	11 34 8.69	2.3865	2 10 11.0	16.335	9	13 27 14.38	2.4420	14 31 20.9	13.974
10	11 36 25.94	2.3886	2 26 30.6	16.340	10	13 29 41.02	2.4460	14 45 4.3	13.971
11	11 38 43.32	2.3907	2 42 49.7	16.342	11	13 32 7.90	2.4499	14 58 41.5	13.967
12	11 41 0.83	2.3929	2 59 8.3	16.345	12	13 34 35.01	2.4539	15 12 12.4	13.961
13	11 43 18.47	2.3952	3 15 26.3	16.343	13	13 37 2.37	2.4579	15 25 36.9	13.954
14	11 45 36.25	2.3975	3 31 43.5	16.340	14	13 39 29.96	2.4619	15 38 54.9	13.945
15	11 47 54.17	2.3999	3 47 59.9	16.344	15	13 41 57.80	2.4659	15 52 6.3	13.933
16	11 50 12.24	2.3923	4 4 15.2	16.346	16	13 44 25.87	2.4698	16 5 10.9	13.920
17	11 52 30.45	2.3948	4 20 29.5	16.347	17	13 46 54.18	2.4738	16 18 8.7	12.905
18	11 54 48.82	2.3974	4 36 42.5	16.345	18	13 49 22.74	2.4779	16 30 59.5	12.798
19	11 57 7.34	2.3999	4 52 54.2	16.181	19	13 51 51.53	2.4818	16 43 43.3	12.670
20	11 59 26.01	2.3136	5 9 4.4	16.185	20	13 54 20.55	2.4857	16 56 19.9	12.549
21	12 1 44.85	2.3163	5 25 13.0	16.192	21	13 56 49.81	2.4897	17 8 49.2	12.428
22	12 4 3.85	2.3181	5 41 19.8	16.098	22	13 59 19.31	2.4936	17 21 11.1	12.303
23	12 6 23.02	2.3209	S. 5 57 24.8	16.095	23	14 1 49.04	2.4974	S. 17 33 25.6	12.178
TUESDAY 26.					THURSDAY 28.				
0	12 8 42.36	2.3238	S. 6 13 27.8	16.083	0	14 4 19.00	2.5012	S. 17 45 32.5	12.060
1	12 11 1.88	2.3268	6 29 28.7	15.996	1	14 6 49.19	2.5061	17 57 31.7	11.921
2	12 13 21.57	2.3298	6 45 27.4	15.900	2	14 9 19.61	2.5089	18 9 23.1	11.791
3	12 15 41.45	2.3328	7 1 23.8	15.818	3	14 11 50.26	2.5127	18 21 6.7	11.680
4	12 18 1.51	2.3359	7 17 17.7	15.876	4	14 14 21.13	2.5165	18 32 42.3	11.565
5	12 20 21.76	2.3391	7 33 9.0	15.832	5	14 16 52.22	2.5201	18 44 9.8	11.500
6	12 22 42.20	2.3423	7 48 57.6	15.787	6	14 19 23.54	2.5238	18 55 29.2	11.366
7	12 25 2.83	2.3454	8 4 43.4	15.738	7	14 21 55.07	2.5273	19 6 40.4	11.116
8	12 27 23.65	2.3487	8 20 26.3	15.688	8	14 24 26.82	2.5300	19 17 43.2	10.976
9	12 29 44.67	2.3520	8 36 6.1	15.636	9	14 26 58.78	2.5344	19 28 37.6	10.825
10	12 32 5.89	2.3554	8 51 42.7	15.582	10	14 29 30.95	2.5378	19 39 23.5	10.693
11	12 34 27.32	2.3588	9 7 16.0	15.525	11	14 32 3.32	2.5412	19 50 0.8	10.549
12	12 36 48.95	2.3622	9 22 45.8	15.467	12	14 34 35.89	2.5445	20 0 29.4	10.404
13	12 39 10.79	2.3657	9 38 12.1	15.406	13	14 37 8.66	2.5478	20 10 49.3	10.267
14	12 41 32.84	2.3692	9 53 34.6	15.344	14	14 39 41.63	2.5511	20 21 0.3	10.109
15	12 43 55.10	2.3727	10 8 53.4	15.280	15	14 42 14.79	2.5543	20 31 2.4	9.960
16	12 46 17.57	2.3763	10 24 8.2	15.213	16	14 44 48.13	2.5572	20 40 55.5	9.809
17	12 48 40.26	2.3801	10 39 19.0	15.145	17	14 47 21.66	2.5608	20 50 39.5	9.636
18	12 51 3.18	2.3838	10 54 25.6	15.074	18	14 49 55.37	2.5633	21 0 14.3	9.508
19	12 53 26.32	2.3874	11 9 27.9	15.000	19	14 52 29.25	2.5662	21 9 39.9	9.380
20	12 55 49.67	2.3911	11 24 25.7	14.924	20	14 55 3.30	2.5699	21 18 56.3	9.265
21	12 58 13.25	2.3949	11 39 19.0	14.848	21	14 57 37.52	2.5717	21 28 3.3	9.087
22	13 0 37.06	2.3987	11 54 7.6	14.770	22	15 0 11.90	2.5743	21 37 0.8	8.960
23	13 3 1.10	2.4026	12 8 51.5	14.690	23	15 2 46.43	2.5768	21 45 48.9	8.721
24	13 5 25.37	2.4064	S. 12 23 30.5	14.608	24	15 5 21.12	2.5793	S. 21 54 27.4	8.561

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.	Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.
FRIDAY 29.					SUNDAY 31.				
0	15 5 21.12	2.5798	8.21° 54' 27.4"	8.261	0	17 9 56.99	2.5686	8.25° 30' 10.9"	0.364
1	15 7 55.95	2.5817	22 2 56.3	8.400	1	17 12 30.84	2.5624	25 30 27.7	0.196
2	15 10 30.92	2.5840	22 11 15.5	8.330	2	17 15 4.48	2.5580	25 30 34.5	0.030
3	15 13 6.03	2.5862	22 19 25.0	8.077	3	17 17 37.92	2.5555	25 30 31.3	0.136
4	15 15 41.26	2.5888	22 27 24.8	7.914	4	17 20 11.14	2.5518	25 30 18.1	0.303
5	15 18 16.62	2.5908	22 35 14.7	7.750	5	17 22 44.14	2.5481	25 29 55.0	0.467
6	15 20 52.09	2.5923	22 42 54.8	7.685	6	17 25 16.91	2.5443	25 29 22.0	0.631
7	15 23 27.68	2.5940	22 50 24.9	7.419	7	17 27 49.44	2.5403	25 28 39.2	0.795
8	15 26 3.37	2.5957	22 57 45.1	7.352	8	17 30 21.73	2.5361	25 27 46.6	0.957
9	15 28 39.16	2.5973	23 4 55.2	7.084	9	17 32 53.77	2.5319	25 26 44.3	1.120
10	15 31 15.05	2.5988	23 11 55.2	6.815	10	17 35 25.56	2.5277	25 25 32.2	1.280
11	15 33 51.02	2.6003	23 18 45.1	6.747	11	17 37 57.09	2.5233	25 24 10.5	1.441
12	15 36 27.07	2.6018	23 25 24.9	6.677	12	17 40 28.35	2.5186	25 22 39.2	1.600
13	15 39 3.20	2.6037	23 31 54.4	6.607	13	17 42 59.34	2.5143	25 20 58.4	1.750
14	15 41 39.39	2.6057	23 38 13.8	6.537	14	17 45 30.05	2.5095	25 19 8.1	1.916
15	15 44 15.64	2.6068	23 44 22.9	6.466	15	17 48 0.48	2.5047	25 17 8.4	2.072
16	15 46 51.94	2.6084	23 50 21.8	5.986	16	17 50 30.62	2.4998	25 14 59.4	2.227
17	15 49 28.29	2.6093	23 56 10.3	5.793	17	17 53 0.46	2.4948	25 12 41.1	2.383
18	15 52 4.68	2.6098	24 1 48.5	5.600	18	17 55 30.00	2.4898	25 10 13.5	2.536
19	15 54 41.10	2.6073	24 7 16.3	5.377	19	17 57 59.24	2.4847	25 7 36.8	2.687
20	15 57 17.54	2.6075	24 12 33.8	5.304	20	18 0 28.17	2.4796	25 4 51.0	2.839
21	15 59 54.00	2.6077	24 17 40.8	5.080	21	18 2 56.78	2.4743	25 1 56.1	2.989
22	16 2 30.47	2.6078	24 22 37.4	4.866	22	18 5 25.08	2.4690	24 58 52.3	3.138
23	16 5 6.94	2.6078	8.24 27 23.6	4.653	23	18 7 53.05	2.4634	8.24 55 39.5	3.286
SATURDAY 30.					MONDAY, APRIL 1.				
0	16 7 43.40	2.6076	8.24 31 59.3	4.808	0	18 10 20.69	2.4579	8.24 53 17.9	3.433
1	16 10 19.85	2.6073	24 36 24.6	4.836					
2	16 12 56.28	2.6068	24 40 39.5	4.100					
3	16 15 32.68	2.6064	24 44 43.9	3.956					
4	16 18 9.05	2.6067	24 48 37.8	3.815					
5	16 20 45.37	2.6049	24 52 21.3	3.637					
6	16 23 21.64	2.6040	24 55 54.3	3.461					
7	16 25 57.85	2.6030	24 59 16.9	3.288					
8	16 28 34.00	2.6018	25 2 29.0	3.114					
9	16 31 10.07	2.6004	25 5 30.6	2.940					
10	16 33 46.06	2.5991	25 8 21.8	2.766					
11	16 36 21.96	2.5978	25 11 2.6	2.593					
12	16 38 57.76	2.5968	25 13 33.0	2.420					
13	16 41 33.46	2.5940	25 15 53.0	2.245					
14	16 44 9.04	2.5920	25 18 2.5	2.071					
15	16 46 44.50	2.5900	25 20 1.6	1.899					
16	16 49 19.83	2.5877	25 21 50.4	1.737					
17	16 51 55.03	2.5854	25 23 28.9	1.565					
18	16 54 30.08	2.5829	25 24 57.0	1.393					
19	16 57 4.98	2.5804	25 26 14.8	1.211					
20	16 59 39.73	2.5776	25 27 22.4	1.041					
21	17 2 14.31	2.5748	25 28 19.8	0.871					
22	17 4 48.72	2.5720	25 29 7.0	0.701					
23	17 7 22.95	2.5692	25 29 44.0	0.532					
24	17 9 56.99	2.5658	8.25 30 10.9	0.364					

PHASES OF THE MOON.

☾ Last Quarter, . . . 3 7 16.4
 ● New Moon, . . . 11 1 36.9
 ☽ First Quarter, . . . 19 5 32.0
 ○ Full Moon, . . . 26 2 15.4

☾ Apogee, 13 12.0
 ☾ Perigee, 26 11.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Jupiter W.	81° 19' 48"	3188	83° 8' 41"	3196	84° 57' 14"	3210	86° 45' 27"	3223
	Regulus W.	73 3 55	3218	74 51 55	3231	76 39 36	3245	78 26 57	3256
	Saturn W.	65 24 11	3210	67 12 24	3228	69 0 18	3235	70 47 54	3247
	Spica W.	19 7 36	3264	20 54 29	3269	22 41 14	3276	24 27 49	3286
	α Aquilæ E.	82 48 2	3783	81 13 12	3800	79 38 44	3819	78 4 41	3841
	SUN E.	119 56 31	3636	118 16 7	3640	116 36 2	3653	114 56 16	3577
2	Jupiter W.	95 41 28	3298	97 27 38	3307	99 13 28	3321	100 58 57	3336
	Regulus W.	87 18 41	3237	89 4 1	3243	90 49 0	3256	92 33 38	3270
	Saturn W.	79 41 1	3216	81 26 39	3229	83 11 56	3244	84 56 52	3267
	Spica W.	33 17 10	3239	35 2 13	3252	36 46 57	3265	38 31 22	3278
	α Aquilæ E.	70 21 51	3908	68 50 58	3927	67 20 42	3939	65 51 5	3962
	SUN E.	106 42 24	3651	105 4 38	3656	103 27 13	3681	101 50 8	3697
3	Saturn W.	93 36 27	3429	95 19 21	3443	97 1 55	3457	98 44 9	3473
	Spica W.	47 8 44	3445	48 51 15	3459	50 33 26	3473	52 15 18	3486
	α Aquilæ E.	58 33 56	3259	57 8 57	3306	55 44 53	3356	54 21 46	3409
	SUN E.	93 49 53	3774	92 14 51	3789	90 40 9	3806	89 5 48	3820
4	Spica W.	60 39 54	3658	62 19 54	3668	63 59 36	3679	65 39 0	3692
	Antares W.	14 54 57	3653	16 34 56	3666	18 14 38	3677	19 54 4	3690
	α Aquilæ E.	47 42 34	3739	46 26 28	3821	45 11 48	3911	43 58 39	4008
	SUN E.	81 18 54	3694	79 46 28	3709	78 14 21	3724	76 42 33	3738
5	Spica W.	73 51 40	3654	75 29 22	3668	77 6 48	3677	78 43 59	3690
	Antares W.	28 7 5	3650	29 44 52	3661	31 22 24	3673	32 59 40	3684
	α Aquilæ E.	38 19 29	4656	37 17 52	4690	36 18 40	4925	35 22 4	5242
	SUN E.	69 7 56	3607	67 37 52	3621	66 8 5	3634	64 38 34	3647
6	Spica W.	86 46 8	3743	88 21 51	3753	89 57 20	3764	91 32 35	3773
	Antares W.	41 2 18	3738	42 38 7	3748	44 13 43	3759	45 49 5	3769
	SUN E.	57 14 53	3109	55 46 54	3120	54 19 9	3132	52 51 38	3144
7	Antares W.	53 42 46	3815	55 16 54	3824	56 50 51	3833	58 24 36	3842
	SUN E.	45 37 33	3200	44 11 24	3211	42 45 28	3222	41 19 45	3232
8	Antares W.	66 10 42	3881	67 43 25	3898	69 15 59	3906	70 48 23	3908
	SUN E.	34 14 22	3288	32 49 57	3300	31 25 45	3312	30 1 47	3324
13	SUN W.	21 40 44	3845	23 0 18	3840	24 19 58	3854	25 39 45	3857
	Aldebaran E.	54 44 42	3155	53 17 39	3158	51 50 40	3163	50 23 47	3169
	Pollux E.	96 36 0	3104	95 7 55	3105	93 39 51	3106	92 11 49	3106
14	SUN W.	32 20 2	3807	33 40 18	3805	35 0 37	3801	36 21 0	3496
	Aldebaran E.	43 11 0	3197	41 44 47	3204	40 18 42	3210	38 52 45	3219
	Pollux E.	84 51 58	3110	83 24 1	3110	81 56 4	3110	80 28 7	3110
	Jupiter E.	112 13 43	3667	110 44 41	3657	109 15 39	3657	107 46 37	3656
15	SUN W.	43 3 50	3480	44 24 37	3476	45 45 28	3471	47 6 24	3467
	Aldebaran E.	31 45 43	3273	30 21 0	3280	28 56 36	3286	27 32 34	3290
	Pollux E.	73 8 5	3104	71 40 0	3101	70 11 52	3098	68 43 40	3096
	Jupiter E.	100 21 0	3647	98 51 46	3644	97 22 28	3642	95 53 7	3639
16	SUN W.	53 52 29	3438	55 14 2	3432	56 35 42	3425	57 57 30	3418
	Pollux E.	61 21 49	3079	59 53 14	3074	58 24 33	3070	56 55 47	3066

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Jupiter W.	88° 33' 26"	2287	90° 20' 53"	2281	92° 8' 5"	2264	93° 54' 57"	2279
	Regulus W.	80 13 58	2272	82 0 39	2265	83 47 0	2259	85 33 1	2213
	Saturn W.	72 35 11	2260	74 22 9	2274	76 8 46	2268	77 55 3	2201
	Spica W.	26 14 11	2294	28 0 20	2204	29 46 13	2215	31 31 50	2227
	α Aquilæ E.	76 31 6	2268	74 58 0	2267	73 25 24	2212	71 53 20	2239
	SUN E.	113 16 50	2292	111 37 44	2206	109 58 57	2231	108 20 30	2236
2	Jupiter W.	102 44 5	2250	104 28 52	2264	106 13 18	2279	107 57 23	2293
	Regulus W.	94 17 56	2284	96 1 53	2299	97 45 29	2413	99 28 45	2426
	Saturn W.	86 41 28	2272	88 25 43	2286	90 9 38	2400	91 53 13	2416
	Spica W.	40 15 29	2291	41 59 17	2405	43 42 45	2418	45 25 54	2431
	α Aquilæ E.	64 22 9	2297	62 53 56	2134	61 26 28	2173	59 59 47	2215
	SUN E.	100 13 24	2713	98 37 1	2728	97 0 58	2743	95 25 15	2759
3	Saturn W.	100 26 2	2486	102 7 35	2499	103 48 49	2513	105 29 44	2527
	Spica W.	53 56 51	2499	55 38 5	2513	57 19 0	2527	58 59 36	2540
	α Aquilæ E.	52 59 40	2406	51 38 38	2527	50 18 44	2502	49 0 1	2568
	SUN E.	87 31 46	2535	85 58 4	2550	84 24 41	2566	82 51 38	2580
4	Spica W.	67 18 6	2604	68 56 55	2617	70 35 27	2629	72 13 42	2643
	Antares W.	21 33 13	2601	23 12 6	2614	24 50 42	2626	26 29 2	2638
	α Aquilæ E.	42 47 7	4114	41 37 19	4230	40 29 21	4356	39 23 22	4490
	SUN E.	75 11 2	2662	73 39 49	2666	72 8 54	2681	70 38 17	2693
5	Spica W.	80 20 54	2700	81 57 34	2710	83 34 0	2723	85 10 11	2733
	Antares W.	34 36 41	2695	36 13 27	2707	37 49 58	2717	39 26 15	2728
	α Aquilæ E.	34 28 14	5487	33 37 21	5766	32 49 38	6064	32 5 17	6446
	SUN E.	63 9 19	3090	61 40 20	3072	60 11 36	3064	58 43 7	3096
6	Spica W.	93 7 38	2783	94 42 28	2798	96 17 5	2803	97 51 30	2813
	Antares W.	47 24 14	2779	48 59 10	2788	50 33 54	2797	52 8 26	2806
	SUN E.	51 24 22	3166	49 57 20	3167	48 30 31	3178	47 3 55	3189
7	Antares W.	59 58 10	2860	61 31 33	2868	63 4 46	2866	64 37 49	2873
	SUN E.	39 54 15	3243	38 28 57	3254	37 3 52	3255	35 39 0	3277
8	Antares W.	72 20 38	2910	73 52 44	2917	75 24 41	2924	76 56 30	2930
	SUN E.	28 38 3	3337	27 14 34	3351	25 51 21	3355	24 28 24	3378
13	SUN W.	26 59 39	2623	28 19 38	2618	29 39 42	2615	30 59 50	2611
	Aldebaran E.	48 57 1	3175	47 30 22	3180	46 3 49	3184	44 37 21	3190
	Pollux E.	90 43 49	3109	89 15 50	3110	87 47 52	3110	86 19 55	3110
14	SUN W.	37 41 26	3495	39 1 56	3491	40 22 30	3488	41 43 8	3484
	Aldebaran E.	37 26 58	3237	36 1 21	3236	34 35 55	3247	33 10 42	3256
	Pollux E.	79 0 9	3109	77 32 10	3108	76 4 10	3106	74 36 8	3106
	Jupiter E.	106 17 33	3055	104 48 28	3053	103 19 21	3052	101 50 12	3049
15	SUN W.	48 27 25	3462	49 48 32	3456	51 9 45	3451	52 31 4	3446
	Aldebaran E.	26 8 57	3357	24 45 51	3358	23 23 21	3426	22 1 34	3473
	Pollux E.	67 15 25	3093	65 47 7	3090	64 18 45	3087	62 50 19	3083
	Jupiter E.	94 23 42	3035	92 54 13	3030	91 24 38	3026	89 54 58	3023
16	SUN W.	59 19 26	3410	60 41 31	3401	62 3 46	3393	63 26 10	3386
	Pollux E.	55 26 55	3080	53 57 57	3055	52 28 52	3050	50 59 41	3043

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	IIIh.	P. L. of DM.	VIh.	P. L. of DM.	IXh.	P. L. of DM.
16	Jupiter E.	88° 25' 13	3013	86° 55' 22	3013	85° 25' 24	3006	83° 55' 19	3000
	Regulus E.	98 11 12	3047	96 41 57	3043	95 12 36	3036	93 43 8	3030
	Saturn E.	104 44 14	3032	103 14 45	3029	101 45 8	3023	100 15 23	3016
17	SUN W.	64 48 44	3375	66 11 29	3369	67 34 25	3364	68 57 32	3365
	Pollux E.	49 30 22	3038	48 0 56	3033	46 31 23	3026	45 1 42	3020
	Jupiter E.	76 22 50	3064	74 51 52	3065	73 20 44	3047	71 49 25	3038
	Regulus E.	86 13 41	3023	84 43 19	3024	83 12 46	3016	81 42 2	3008
	Saturn E.	92 44 28	3079	91 13 49	3070	89 42 59	3061	88 11 57	3052
18	SUN W.	75 56 23	3298	77 20 51	3273	78 45 35	3269	80 10 34	3265
	Mars W.	24 26 9	3120	25 52 19	3123	27 18 50	3164	28 45 42	3168
	Pollux E.	37 31 24	3069	36 0 58	3064	34 30 25	3079	32 59 46	3076
	Jupiter E.	64 9 46	3067	63 37 10	3075	61 4 19	3063	59 31 13	3062
	Regulus E.	74 5 15	3019	73 33 13	3001	71 0 55	3000	69 26 22	3076
	Saturn E.	80 33 43	3090	79 1 23	3088	77 28 49	3076	75 56 0	3063
19	SUN W.	87 19 46	3170	88 46 31	3133	90 13 36	3136	91 41 0	3130
	Mars W.	36 5 21	3030	37 34 20	3043	39 3 40	3025	40 33 22	3007
	Aldebaran W.	19 49 48	3068	21 14 43	3102	22 41 7	3123	24 8 50	3065
	Jupiter E.	51 41 41	3736	50 6 54	3773	48 31 49	3787	46 56 25	3743
	Regulus E.	61 41 27	3009	60 7 11	3704	58 32 35	3779	56 57 40	3764
	Saturn E.	68 7 46	3797	66 33 14	3783	64 58 23	3766	63 23 13	3754
20	SUN W.	99 3 19	3021	100 32 53	3013	102 9 50	3003	103 33 11	3074
	Mars W.	48 7 29	3015	49 39 29	3006	51 11 53	3076	52 44 42	3067
	Aldebaran W.	31 42 41	3066	33 15 56	3023	34 49 54	3793	36 24 33	3761
	Jupiter E.	38 54 26	3068	37 17 0	3661	35 39 14	3634	34 1 7	3630
	Regulus E.	48 57 58	3064	47 20 57	3066	45 43 34	3061	44 5 48	3033
	Saturn E.	55 22 26	3078	53 45 16	3080	52 7 43	3044	50 29 48	3030
	Spica E.	102 59 54	3076	101 22 41	3068	99 45 5	3040	98 7 5	3023
21	SUN W.	111 11 1	3070	112 43 50	3066	114 17 5	3036	115 50 46	3017
	Mars W.	60 35 10	3787	63 10 34	3787	63 46 25	3716	65 22 43	3696
	Aldebaran W.	44 27 9	3029	46 5 25	3004	47 44 15	3009	49 23 37	3006
	Regulus E.	35 51 15	3660	34 11 11	3633	32 30 44	3617	30 49 54	3603
	Saturn E.	42 14 42	3647	40 34 34	3633	38 54 6	3617	37 13 17	3603
	Spica E.	89 50 52	3630	88 10 21	3611	86 29 23	3492	84 47 59	3473
22	SUN W.	123 45 40	3716	125 21 58	3696	126 58 41	3676	128 35 50	3660
	Mars W.	73 31 3	3094	75 10 6	3074	76 49 36	3064	78 29 33	3036
	Aldebaran W.	57 48 30	3443	59 31 3	3423	61 14 6	3401	62 57 40	3380
	Pollux W.	16 24 41	3749	18 0 16	3695	19 37 41	3696	21 16 41	3636
	Saturn E.	28 44 18	3443	27 1 43	3436	25 18 59	3433	23 36 10	3433
	Spica E.	76 14 15	3278	74 30 8	3269	72 45 35	3240	71 0 34	3232
23	Mars W.	86 56 6	3440	88 38 44	3433	90 21 48	3403	92 5 18	3387
	Aldebaran W.	71 42 52	3223	73 29 18	3204	75 16 11	3246	77 3 30	3229
	Pollux W.	29 48 29	3244	31 33 24	3216	33 19 1	3209	35 5 17	3204
	Spica E.	62 8 51	3233	60 21 12	3216	58 33 8	3199	56 44 39	3183
	Antares E.	107 49 52	3227	106 2 4	3209	104 13 50	3193	102 25 10	3176
24	Mars W.	100 48 47	3207	102 34 37	3203	104 20 48	3279	106 7 19	3206
	Aldebaran W.	86 6 16	3168	87 55 59	3187	89 46 2	3134	91 36 25	3111
	Pollux W.	44 5 7	3160	45 54 35	3148	47 44 29	3126	49 34 48	3111

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
16	Jupiter E.	82° 25' 6"	2908	80° 54' 45"	2907	79° 24' 16"	2908	77° 53' 36"	2973
	Regulus E.	92 13 39	2903	90 43 48	2916	89 13 55	2909	87 43 53	2901
	Saturn E.	98 45 30	2909	97 15 28	2901	95 45 17	2994	94 14 57	2987
17	Sun W.	70 26 52	2934	71 44 24	2923	73 8 10	2911	74 32 9	2926
	Pollux E.	43 31 54	2914	42 1 59	2907	40 31 55	2901	39 1 43	2996
	Jupiter E.	70 17 54	2906	68 46 11	2919	67 14 16	2909	65 42 8	2986
	Regulus E.	80 11 6	2906	78 39 58	2946	77 8 37	2935	75 37 3	2924
	Saturn E.	86 40 44	2943	85 9 19	2923	83 37 41	2921	82 5 49	2910
18	Sun W.	81 35 50	2931	83 1 22	2916	84 27 12	2901	85 53 20	2186
	Mars W.	30 12 56	2190	31 40 31	2111	33 8 27	2906	34 36 43	2977
	Pollux E.	31 29 3	2973	29 58 16	2971	28 27 27	2971	26 56 38	2973
	Jupiter E.	57 57 52	2920	56 24 15	2936	54 50 21	2913	53 16 10	2799
	Regulus E.	67 55 33	2964	66 22 28	2929	64 49 5	2937	63 15 25	2923
	Saturn E.	74 22 54	2961	72 49 32	2926	71 15 54	2926	69 41 59	2911
19	Sun W.	93 8 45	2108	94 36 51	2906	96 5 18	2908	97 34 7	2949
	Mars W.	42 3 26	2989	43 33 52	2971	45 4 41	2953	46 35 53	2934
	Aldebaran W.	25 37 43	2914	27 7 38	2909	28 38 29	2929	30 10 11	2991
	Jupiter E.	45 20 42	2798	43 44 39	2713	42 8 13	2927	40 31 31	2981
	Regulus E.	55 22 25	2749	53 46 50	2733	52 10 54	2717	50 34 37	2701
	Saturn E.	61 47 45	2799	60 11 57	2733	58 35 48	2708	56 59 19	2692
20	Sun W.	105 3 56	2966	106 35 5	2966	108 6 39	2916	109 38 37	2986
	Mars W.	54 17 56	2937	55 51 36	2918	57 25 41	2798	59 0 12	2777
	Aldebaran W.	37 59 52	2723	39 35 48	2706	41 12 20	2909	42 49 27	2964
	Jupiter E.	32 22 39	2904	30 43 50	2909	29 4 40	2974	27 25 10	2989
	Regulus E.	42 27 40	2919	40 49 9	2909	39 10 14	2963	37 30 56	2966
	Saturn E.	48 51 31	2913	47 12 52	2906	45 33 51	2969	43 54 28	2963
	Spica E.	96 28 40	2904	94 49 51	2906	93 10 37	2967	91 30 57	2949
21	Sun W.	117 24 52	2797	118 59 24	2776	120 34 23	2759	122 9 48	2736
	Mars W.	66 59 28	2976	68 36 40	2946	70 14 20	2935	71 52 28	2915
	Aldebaran W.	51 3 32	2953	52 43 59	2910	54 24 58	2499	56 6 28	2466
	Regulus E.	29 8 43	2496	27 27 10	2471	25 45 16	2457	24 3 2	2443
	Saturn E.	35 32 7	2499	33 50 37	2476	32 8 48	2463	30 26 41	2450
	Spica E.	83 6 8	2466	81 23 51	2436	79 41 6	2416	77 57 54	2397
22	Sun W.	130 13 25	2949	131 51 25	2929	133 29 50	2904	135 8 40	2888
	Mars W.	80 9 58	2916	81 50 50	2496	83 32 9	2477	85 13 54	2468
	Aldebaran W.	64 41 44	2909	66 26 18	2929	68 11 21	2919	69 56 53	2909
	Pollux W.	22 57 1	2499	24 38 29	2447	26 20 52	2499	28 4 19	2376
	Saturn E.	21 53 22	2436	20 10 41	2448	18 28 14	2466	16 46 11	2490
	Spica E.	69 15 7	2904	67 29 13	2926	65 42 52	2967	63 56 4	2260
23	Mars W.	93 49 12	2970	95 33 30	2933	97 18 13	2937	99 3 19	2923
	Aldebaran W.	78 51 14	2912	80 39 23	2196	82 27 57	2180	84 16 55	2166
	Pollux W.	36 52 9	2941	38 39 36	2916	40 27 36	2196	42 16 7	2178
	Spica E.	54 55 46	2167	53 6 29	2163	51 16 50	2137	49 26 48	2124
	Antares E.	100 36 5	2169	98 46 36	2144	96 56 44	2128	95 6 28	2114
24	Mars W.	107 54 8	2934	109 41 15	2949	111 28 40	2931	113 16 21	2921
	Aldebaran W.	98 27 7	2100	95 18 6	2999	97 9 22	2979	99 0 54	2990
	Pollux W.	51 25 30	2906	53 16 35	2963	55 8 0	2970	56 59 45	2969

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
24	Jupiter W.	17° 17' 58"	2103	19° 7' 23"	2136	20° 57' 27"	2113	22° 48' 7"	2001
	Spica E.	47 36 25	2110	45 45 41	2007	43 54 37	2065	42 3 14	2073
	Antares E.	93 15 50	2100	91 24 51	2086	89 33 30	2072	87 41 48	2061
25	Pollux W.	58 51 47	2048	60 44 6	2030	62 36 40	2030	64 29 28	2021
	Jupiter W.	32 8 22	2018	34 1 28	2007	35 54 52	1997	37 48 31	1999
	Regulus W.	21 50 24	2068	23 42 20	2048	25 34 40	2034	27 27 21	2023
	Saturn W.	16 27 40	2216	18 15 41	2171	20 4 52	2132	21 55 2	2101
	Spica E.	32 42 18	2026	30 49 28	2023	28 56 29	2016	27 3 23	2014
	Antares E.	78 18 55	2009	76 25 34	2000	74 32 0	1992	72 38 13	1986
26	Pollux W.	73 56 10	1994	75 49 53	1992	77 43 40	1990	79 37 30	1988
	Jupiter W.	47 19 35	1990	49 14 12	1968	51 8 53	1956	53 3 37	1955
	Regulus W.	36 54 38	1984	38 48 38	1980	40 42 44	1977	42 36 54	1975
	Saturn W.	31 15 13	2014	33 8 25	2005	35 1 51	1998	36 55 28	1993
	Antares E.	63 7 3	1963	61 12 30	1961	59 17 54	1960	57 23 16	1959
27	Pollux W.	89 6 32	1998	91 0 10	2003	92 53 41	2007	94 47 4	2014
	Jupiter W.	62 37 12	1992	64 31 46	1986	66 26 14	1971	68 20 34	1977
	Regulus W.	52 7 57	1980	54 2 3	1964	55 56 2	1969	57 49 54	1964
	Saturn W.	46 24 57	1966	48 18 53	1960	50 12 45	1962	52 6 32	1966
	Antares E.	47 50 20	1960	45 55 57	1974	44 1 41	1979	42 7 33	1984
	α Aquilæ E.	101 9 55	2040	99 29 37	2003	97 49 16	2038	96 8 55	2040
28	Jupiter W.	77 49 33	2016	79 42 42	2026	81 35 35	2087	83 28 12	2048
	Regulus W.	67 16 47	2082	69 9 32	2041	71 2 2	2062	72 54 16	2063
	Saturn W.	61 33 22	2080	63 26 10	2089	65 18 43	2049	67 11 1	2090
	Spica W.	13 24 42	2118	15 15 14	2109	17 6 0	2106	18 56 52	2106
	Antares E.	32 39 36	2086	30 46 41	2086	28 54 3	2047	27 1 42	2050
	α Aquilæ E.	87 48 37	2074	86 9 7	2066	84 29 55	2001	82 51 2	2017
29	Jupiter W.	92 46 37	2112	94 37 17	2126	96 27 34	2142	98 17 29	2167
	Regulus W.	82 10 49	2127	84 1 7	2141	85 51 4	2155	87 40 39	2171
	Saturn W.	76 28 6	2122	78 18 32	2126	80 8 37	2151	81 58 19	2166
	Spica W.	28 9 42	2143	29 59 36	2166	31 49 12	2167	33 38 29	2180
	α Aquilæ E.	74 42 42	2721	73 6 30	2747	71 30 53	2776	69 55 53	2806
	Fomalhaut E.	99 27 32	2636	97 47 11	2646	96 7 5	2661	94 27 16	2674
	Sun E.	138 34 22	2486	136 52 6	2499	135 10 9	2492	133 28 31	2497
30	Jupiter W.	107 21 8	2289	109 8 37	2266	110 55 41	2274	112 42 19	2291
	Regulus W.	96 42 39	2261	98 29 50	2269	100 16 35	2266	102 2 55	2268
	Saturn W.	91 1 3	2246	92 48 23	2262	94 35 18	2260	96 21 47	2267
	Spica E.	42 39 38	2266	44 26 43	2271	46 13 25	2267	47 59 43	2264
	α Aquilæ W.	62 11 30	2066	60 41 2	2031	59 11 28	2077	57 42 50	2126
	Fomalhaut E.	86 13 9	2646	84 35 29	2676	82 58 15	2696	81 21 28	2716
	α Pegasi E.	107 8 43	2406	105 25 15	2419	103 42 8	2434	101 59 22	2449
	Sun E.	125 5 41	2677	123 26 15	2696	121 47 13	2612	120 8 35	2630
31	Saturn W.	105 7 48	2387	106 51 42	2406	108 35 10	2433	110 18 12	2441
	Spica W.	56 44 59	2391	58 28 47	2406	60 12 10	2436	61 55 8	2442
	α Aquilæ E.	50 35 51	2429	49 14 7	2403	47 53 46	2403	46 34 53	2399
	Fomalhaut E.	73 25 3	2637	71 51 23	2664	70 18 18	2662	68 45 49	2621
	α Pegasi E.	93 31 5	2682	91 50 36	2680	90 10 32	2667	88 30 52	2666
	Sun E.	112 1 35	2722	110 25 25	2741	108 49 40	2760	107 14 20	2779

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
24	Jupiter	W.	24° 39' 20"	2078	26° 31' 1"	2087	28° 23' 6"	2043	30° 15' 34"	2080
	Spica	E.	40 11 33	2083	38 19 36	2083	36 27 23	2044	34 34 57	2085
	Antares	E.	85 49 48	2049	83 57 30	2087	82 4 54	2027	80 12 2	2017
25	Pollux	W.	66 22 29	2014	68 15 41	2008	70 9 3	2003	72 2 33	1998
	Jupiter	W.	39 42 23	1981	41 36 27	1975	43 30 41	1969	45 25 4	1964
	Regulus	W.	29 20 20	2013	31 13 36	2008	33 7 5	1995	35 0 46	1989
	Saturn	W.	23 45 59	2075	25 37 36	2058	27 29 44	2039	29 22 18	2026
	Spica	E.	25 10 12	2014	23 16 59	2014	21 23 46	2017	19 30 38	2023
	Antares	E.	70 44 16	1979	68 50 9	1974	66 55 54	1969	65 1 31	1966
26	Pollux	W.	81 31 21	1969	83 25 12	1960	85 19 2	1962	87 12 49	1964
	Jupiter	W.	54 58 22	1986	56 53 7	1965	58 47 52	1957	60 42 34	1960
	Regulus	W.	44 31 7	1975	46 25 21	1976	48 19 35	1976	50 13 47	1977
	Saturn	W.	38 49 14	1989	40 43 6	1986	42 37 2	1986	44 30 59	1985
	Antares	E.	55 28 37	1969	53 33 58	1961	51 39 22	1963	49 44 49	1965
27	Pollux	W.	96 40 17	2020	98 33 20	2028	100 26 11	2086	102 18 49	2045
	Jupiter	W.	70 14 44	1984	72 8 44	1991	74 2 33	1998	75 56 10	2007
	Regulus	W.	59 43 38	2000	61 37 12	2007	63 30 36	2014	65 23 48	2023
	Saturn	W.	54 0 13	2001	55 53 46	2007	57 47 9	2014	59 40 21	2021
	Antares	E.	40 13 34	1991	38 19 45	1999	36 26 9	2007	34 32 46	2016
	α Aquilæ	E.	94 28 37	2043	92 48 23	2048	91 8 17	2056	89 28 21	2064
28	Jupiter	W.	85 20 31	2080	87 12 32	2073	89 4 14	2086	90 55 36	2089
	Regulus	W.	74 46 12	2075	76 37 50	2068	78 29 10	2069	80 20 10	2113
	Saturn	W.	69 3 2	2071	70 54 46	2068	72 46 12	2065	74 37 19	2108
	Spica	W.	20 47 44	2109	22 38 30	2115	24 29 7	2123	26 19 32	2133
	Antares	E.	25 9 40	2073	23 17 57	2068	21 26 34	2069	19 35 33	2114
	α Aquilæ	E.	81 12 30	2086	79 34 22	2084	77 56 40	2075	76 19 26	2087
29	Jupiter	W.	100 7 1	2173	101 56 9	2188	103 44 54	2206	105 33 14	2223
	Regulus	W.	89 29 50	2186	91 18 38	2202	93 7 3	2216	94 55 3	2225
	Saturn	W.	83 47 39	2189	85 36 36	2196	87 25 9	2212	89 13 18	2220
	Spica	W.	35 27 26	2184	37 16 2	2208	39 4 17	2224	40 52 9	2236
	α Aquilæ	E.	68 21 33	2288	66 47 54	2273	65 14 59	2298	63 42 50	2306
	Fomalhaut	E.	92 47 45	2288	91 8 34	2303	89 29 43	2319	87 51 14	2337
	Sun	E.	131 47 14	2513	130 6 18	2537	128 25 43	2543	126 45 30	2561
30	Jupiter	W.	114 28 32	2309	116 14 19	2327	117 59 39	2345	119 44 33	2364
	Regulus	W.	103 48 50	2321	105 34 19	2336	107 19 23	2367	109 4 0	2375
	Saturn	W.	98 7 51	2315	99 53 29	2333	101 38 41	2340	103 23 28	2369
	Spica	W.	49 45 36	2321	51 31 5	2339	53 16 8	2356	55 0 46	2373
	α Aquilæ	E.	56 15 12	2379	54 48 38	2396	53 23 11	2396	51 58 54	2359
	Fomalhaut	E.	79 45 10	2788	78 9 21	2793	76 34 3	2786	74 59 17	2811
	α Pegasi	E.	100 16 57	2485	98 34 54	2481	96 53 14	2498	95 11 58	2515
	Sun	E.	118 30 21	2649	116 52 32	2687	115 15 8	2686	113 38 9	2704
31	Saturn	W.	112 0 48	2480	113 42 58	2477	115 24 43	2496	117 6 2	2514
	Spica	W.	63 37 41	2461	65 19 49	2478	67 1 33	2496	68 42 52	2513
	α Aquilæ	E.	45 17 33	2764	44 1 53	2806	42 47 58	2975	41 35 54	4100
	Fomalhaut	E.	67 13 57	2981	65 42 43	2993	64 12 8	3014	62 42 13	3048
	α Pegasi	E.	86 51 36	2603	85 12 45	2631	83 34 19	2640	81 56 18	2659
	Sun	E.	105 39 25	2798	104 4 54	2817	102 30 48	2836	100 57 7	2854

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Mon.	1	^h 0 ^m 43 ^s 12.55	9.097	N. 4° 38' 58.5"	57.79	16' 1.92"	64.51	^m 3 ^s 53.14	0.759	
Tues.	2	0 46 50.91	9.103	5 2 2.6	57.58	16 1.63	64.53	3 35.00	0.754	
Wed.	3	0 50 29.43	9.110	5 25 1.6	57.35	16 1.35	64.55	3 17.01	0.747	
Thur.	4	0 54 8.12	9.118	5 47 55.0	57.11	16 1.07	64.57	2 59.20	0.739	
Fri.	5	0 57 46.99	9.126	6 10 42.6	56.86	16 0.79	64.59	2 41.58	0.731	
Sat.	6	1 1 26.06	9.134	6 33 23.8	56.59	16 0.51	64.62	2 24.13	0.723	
Sun.	7	1 5 5.35	9.143	6 55 58.3	56.30	16 0.23	64.65	2 6.91	0.713	
Mon.	8	1 8 44.88	9.153	7 18 25.7	56.00	15 59.95	64.68	1 49.93	0.703	
Tues.	9	1 12 24.66	9.164	7 40 45.7	55.68	15 59.68	64.72	1 33.19	0.692	
Wed.	10	1 16 4.71	9.175	8 2 58.1	55.36	15 59.41	64.76	1 16.74	0.681	
Thur.	11	1 19 45.03	9.187	8 25 2.3	55.01	15 59.14	64.80	1 0.56	0.669	
Fri.	12	1 23 25.64	9.199	8 46 58.0	54.65	15 58.87	64.85	0 44.66	0.657	
Sat.	13	1 27 6.54	9.212	9 8 45.0	54.27	15 58.60	64.90	0 29.05	0.644	
Sun.	14	1 30 47.76	9.226	9 30 22.7	53.88	15 58.34	64.95	0 13.75	0.630	
Mon.	15	1 34 29.31	9.240	9 51 50.9	53.47	15 58.08	65.00	0 1.21	0.616	
Tues.	16	1 38 11.19	9.254	10 13 9.2	53.06	15 57.82	65.05	0 15.84	0.601	
Wed.	17	1 41 53.43	9.270	10 34 17.3	52.63	15 57.56	65.11	0 30.12	0.586	
Thur.	18	1 45 36.05	9.286	10 55 14.9	52.18	15 57.30	65.17	0 44.02	0.570	
Fri.	19	1 49 19.06	9.302	11 16 1.7	51.72	15 57.04	65.23	0 57.53	0.554	
Sat.	20	1 53 2.46	9.318	11 36 37.3	51.25	15 56.79	65.29	1 10.64	0.538	
Sun.	21	1 56 46.28	9.336	11 57 1.4	50.77	15 56.54	65.35	1 23.35	0.521	
Mon.	22	2 0 30.52	9.354	12 17 13.7	50.27	15 56.29	65.41	1 35.62	0.503	
Tues.	23	2 4 15.20	9.372	12 37 13.9	49.76	15 56.04	65.48	1 47.46	0.484	
Wed.	24	2 8 0.34	9.392	12 57 1.9	49.24	15 55.79	65.55	1 58.85	0.464	
Thur.	25	2 11 45.96	9.412	13 16 37.2	48.70	15 55.54	65.62	2 9.75	0.444	
Fri.	26	2 15 32.06	9.432	13 35 59.5	48.15	15 55.29	65.69	2 20.17	0.423	
Sat.	27	2 19 18.66	9.453	13 55 8.4	47.59	15 55.04	65.76	2 30.09	0.402	
Sun.	28	2 23 5.78	9.475	14 14 3.7	47.02	15 54.80	65.83	2 39.50	0.380	
Mon.	29	2 26 53.44	9.498	14 32 45.1	46.43	15 54.56	65.91	2 48.37	0.358	
Tues.	30	2 30 41.64	9.521	14 51 12.2	45.83	15 54.32	65.99	2 56.71	0.336	
Wed.	31	2 34 30.39	9.544	N. 15 9 24.7	45.21	15 54.08	66.07	3 4.50	0.313	

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0.13 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	added to Mean Time.		
Mon.	1	0 ^h 43 ^m 11.96 ^s	9.087	N. 4° 38' 54.8"	57.79	3 ^m 53.19 ^s	0.759	0 ^h 39 ^m 18.77 ^s
Tues.	2	0 46 50.37	9.103	5 1 59.2	57.58	3 35.05	0.754	0 43 15.32
Wed.	3	0 50 28.94	9.110	5 24 58.5	57.35	3 17.06	0.747	0 47 11.88
Thur.	4	0 54 7.67	9.118	5 47 52.2	57.11	2 59.24	0.739	0 51 8.43
Fri.	5	0 57 46.59	9.126	6 10 40.0	56.86	2 41.61	0.731	0 55 4.98
Sat.	6	1 1 25.70	9.134	6 33 21.5	56.59	2 24.16	0.722	0 59 1.54
Sun.	7	1 5 5.08	9.143	6 55 56.3	56.30	2 6.94	0.713	1 2 58.09
Mon.	8	1 8 44.60	9.153	7 18 24.0	56.00	1 49.96	0.703	1 6 54.64
Tues.	9	1 12 24.42	9.164	7 40 44.3	55.68	1 33.32	0.692	1 10 51.20
Wed.	10	1 16 4.51	9.175	8 2 56.9	55.36	1 16.76	0.681	1 14 47.75
Thur.	11	1 19 44.87	9.187	8 25 1.4	55.01	1 0.57	0.669	1 18 44.20
Fri.	12	1 23 25.52	9.199	8 46 57.4	54.65	0 44.66	0.656	1 22 40.86
Sat.	13	1 27 6.46	9.212	9 8 44.6	54.27	0 29.05	0.643	1 26 37.41
Sun.	14	1 30 47.72	9.226	9 30 22.5	53.88	0 13.75	0.630	1 30 33.97
Mon.	15	1 34 29.31	9.240	9 51 50.9	53.47	0 1.21	0.616	1 34 30.52
Tues.	16	1 38 11.23	9.254	10 13 9.4	53.06	0 15.84	0.601	1 38 27.07
Wed.	17	1 41 53.51	9.270	10 34 17.7	52.63	0 30.12	0.586	1 42 23.63
Thur.	18	1 45 36.17	9.286	10 55 15.5	52.18	0 44.01	0.570	1 46 20.18
Fri.	19	1 49 19.21	9.302	11 16 2.5	51.73	0 57.53	0.554	1 50 16.74
Sat.	20	1 53 2.64	9.318	11 36 38.3	51.25	1 10.65	0.538	1 54 13.29
Sun.	21	1 56 46.49	9.336	11 57 2.6	50.77	1 23.36	0.521	1 58 9.85
Mon.	22	2 0 30.77	9.354	12 17 15.1	50.37	1 35.63	0.503	2 2 6.40
Tues.	23	2 4 15.48	9.372	12 37 15.5	49.76	1 47.47	0.484	2 6 2.95
Wed.	24	2 8 0.65	9.392	12 57 3.6	49.24	1 58.86	0.464	2 9 59.51
Thur.	25	2 11 46.30	9.412	13 16 39.0	48.70	2 9.76	0.444	2 13 56.06
Fri.	26	2 15 32.43	9.432	13 36 1.4	48.15	2 20.19	0.423	2 17 52.62
Sat.	27	2 19 19.06	9.453	13 55 10.4	47.59	2 30.11	0.402	2 21 49.17
Sun.	28	2 23 6.21	9.475	14 14 5.8	47.02	2 39.52	0.380	2 25 45.73
Mon.	29	2 26 53.89	9.498	14 32 47.3	46.43	2 48.39	0.358	2 29 42.28
Tues.	30	2 30 42.11	9.521	14 51 14.5	45.83	2 56.73	0.336	2 33 38.84
Wed.	31	2 34 30.88	9.544	N. 15° 9' 27.1"	45.21	3 4.51	0.313	2 37 35.39

NOTE.—The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										
Day of the Month.	Day of the Year.	True LONGITUDE.				Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh
		λ		λ'						
		λ	λ'							
1	91	11° 45' 8.8	44° 40.5	147.79	—0.26	0.0000339	53.4	23 16 51.75		
2	92	12 44 14.8	43 46.4	147.72	—0.12	.0001620	53.3	23 12 55.84		
3	93	13 43 19.0	42 50.5	147.65	+0.02	.0002899	53.2	23 8 59.94		
4	94	14 42 21.4	41 52.8	147.57	0.15	.0004178	53.1	23 5 4.04		
5	95	15 41 22.1	40 53.4	147.49	0.28	.0005453	53.0	23 1 8.13		
6	96	16 40 21.0	39 52.2	147.42	0.39	.0006721	52.7	22 57 12.22		
7	97	17 39 18.0	38 49.1	147.34	0.49	.0007983	52.4	22 53 16.31		
8	98	18 38 13.1	37 44.1	147.26	0.56	.0009236	52.0	22 49 20.40		
9	99	19 37 6.3	36 37.2	147.18	0.59	.0010480	51.6	22 45 24.50		
10	100	20 35 57.6	35 28.4	147.10	0.60	.0011714	51.2	22 41 28.59		
11	101	21 34 46.9	34 17.6	147.01	0.57	.0012938	50.8	22 37 32.68		
12	102	22 33 34.0	33 4.6	146.92	0.52	.0014153	50.4	22 33 36.77		
13	103	23 32 19.1	31 49.6	146.83	0.44	.0015357	50.0	22 29 40.86		
14	104	24 31 2.0	30 32.4	146.74	0.34	.0016551	49.6	22 25 44.96		
15	105	25 29 42.7	29 12.9	146.65	0.22	.0017736	49.2	22 21 49.05		
16	106	26 28 21.1	27 51.2	146.55	+0.10	.0018913	48.9	22 17 53.14		
17	107	27 26 57.3	26 27.3	146.46	—0.03	.0020062	48.6	22 13 57.23		
18	108	28 25 31.2	25 1.1	146.37	0.16	.0021244	48.4	22 10 1.32		
19	109	29 24 2.9	23 32.7	146.28	0.26	.0022401	48.1	22 6 5.42		
20	110	30 22 32.5	22 2.1	146.19	0.35	.0023554	47.9	22 2 9.51		
21	111	31 21 0.1	20 29.6	146.10	0.44	.0024703	47.8	21 58 13.60		
22	112	32 19 25.6	18 55.0	146.02	0.49	.0025848	47.6	21 54 17.69		
23	113	33 17 49.1	17 18.4	145.94	0.50	.0026990	47.5	21 50 21.78		
24	114	34 16 10.7	15 39.9	145.86	0.48	.0028129	47.3	21 46 25.88		
25	115	35 14 30.4	13 59.4	145.78	0.42	.0029265	47.2	21 42 29.97		
26	116	36 12 48.3	12 17.2	145.71	0.34	.0030398	47.1	21 38 34.06		
27	117	37 11 4.4	10 33.2	145.64	0.25	.0031527	47.0	21 34 38.15		
28	118	38 9 18.9	8 47.6	145.57	0.15	.0032651	46.8	21 30 42.24		
29	119	39 7 31.9	7 0.4	145.51	—0.02	.0033771	46.5	21 26 46.33		
30	120	40 5 43.4	5 11.7	145.45	+0.12	.0034884	46.2	21 22 50.42		
31	121	41 3 53.4	3 21.6	145.39	+0.26	0.0035987	45.7	21 18 54.51		

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI-DIAMETER.

HORIZONTAL PARALLAX.

MERIDIAN PASSAGE.

AGE.

Noon.

Midnight.

Noon.

Diff. for
1 hour.

Midnight.

Diff. for
1 hour.Diff. for
1 hour.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
1	15' 47.0	15' 39.7	57' 48.8	-2.26	57' 22.1	-2.18	18 ^h 11.8 ^m	2.27	20.9
2	15 32.7	15 26.1	56 56.6	2.08	56 32.4	1.95	19 4.1	2.09	21.9
3	15 20.0	15 14.4	56 9.8	1.81	55 49.0	1.66	19 52.3	1.94	22.9
4	15 9.2	15 4.5	55 29.9	1.51	55 12.7	1.36	20 37.1	1.81	23.9
5	15 0.3	14 56.6	54 57.4	1.20	54 43.9	1.05	21 19.4	1.73	24.9
6	14 53.4	14 50.7	54 32.1	0.90	54 22.2	0.75	22 0.1	1.68	25.9
7	14 48.4	14 46.6	54 14.0	0.62	54 7.3	0.50	22 40.3	1.68	26.9
8	14 45.2	14 44.2	54 2.1	0.37	53 58.4	0.25	23 20.8	1.70	27.9
9	14 43.6	14 43.3	53 56.0	-0.14	53 55.0	-0.03	δ		28.9
10	14 43.4	14 43.8	53 55.3	+0.08	53 56.9	+0.19	0 2.4	1.77	0.2
11	14 44.6	14 45.8	53 59.9	0.30	54 4.2	0.42	0 45.9	1.86	1.2
12	14 47.4	14 49.4	54 10.0	0.54	54 17.2	0.67	1 31.7	1.96	2.2
13	14 51.8	14 54.6	54 26.0	0.80	54 36.4	0.94	2 20.1	2.06	3.2
14	14 57.9	15 1.7	54 48.5	1.08	55 2.3	1.23	3 10.6	2.15	4.2
15	15 5.9	15 10.6	55 17.9	1.37	55 35.3	1.52	4 2.8	2.19	5.2
16	15 15.8	15 21.5	55 54.4	1.67	56 15.2	1.81	4 55.5	2.19	6.2
17	15 27.6	15 34.2	56 37.8	1.95	57 1.8	2.06	5 47.9	2.17	7.2
18	15 41.1	15 48.3	57 27.2	2.16	57 53.6	2.24	6 39.5	2.13	8.2
19	15 55.6	16 3.1	58 20.7	2.28	58 48.0	2.28	7 30.2	2.10	9.2
20	16 10.4	16 17.5	59 15.0	2.23	59 41.1	2.12	8 20.4	2.09	10.2
21	16 24.2	16 30.3	60 5.7	1.96	60 27.9	1.74	9 10.9	2.13	11.2
22	16 35.5	16 39.7	60 47.1	1.46	61 2.8	1.14	10 2.9	2.21	12.2
23	16 42.9	16 44.7	61 14.2	+0.77	61 21.0	+0.36	10 57.2	2.33	13.2
24	16 45.2	16 44.4	61 22.9	-0.05	61 19.7	-0.47	11 54.8	2.47	14.2
25	16 42.2	16 38.7	61 11.7	0.88	60 58.9	1.25	12 55.6	2.59	15.2
26	16 34.1	16 28.4	60 41.9	1.59	60 21.1	1.88	13 58.4	2.62	16.2
27	16 21.9	16 14.7	59 57.1	2.11	59 30.9	2.27	15 0.9	2.57	17.2
28	16 7.1	15 59.3	59 2.9	2.38	58 34.0	2.43	16 0.9	2.41	18.2
29	15 51.4	15 43.5	58 4.8	2.43	57 35.9	2.38	16 56.6	2.22	19.2
30	15 35.8	15 28.5	57 7.9	2.30	56 41.0	2.18	17 47.6	2.03	20.2
31	15 21.6	15 15.2	56 15.8	-2.03	55 52.3	-1.87	18 34.4	1.88	21.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	18 10 20.69	2.4679	S. 24 52 17.9	3.483	0	20 1 10.40	2.1548	S. 19 41 16.9	9.042
1	18 12 48.00	2.4694	24 48 47.5	3.979	1	20 3 19.47	2.1461	19 39 11.7	9.129
2	18 15 14.98	2.4667	24 45 8.4	3.724	2	20 5 28.17	2.1419	19 23 1.4	9.214
3	18 17 41.61	2.4609	24 41 20.6	3.867	3	20 7 36.50	2.1377	19 13 46.0	9.298
4	18 20 7.89	2.4582	24 37 24.3	4.010	4	20 9 44.45	2.1284	19 4 25.6	9.380
5	18 22 33.83	2.4584	24 33 19.4	4.150	5	20 11 52.03	2.1233	18 55 0.3	9.462
6	18 24 59.42	2.4535	24 29 6.2	4.290	6	20 13 59.25	2.1173	18 45 30.1	9.543
7	18 27 24.65	2.4114	24 24 44.5	4.430	7	20 16 6.10	2.1112	18 35 55.1	9.623
8	18 29 49.51	2.4174	24 20 14.6	4.560	8	20 18 12.59	2.1062	18 26 15.4	9.700
9	18 32 14.02	2.4064	24 15 86.5	4.703	9	20 20 18.72	2.0992	18 16 31.0	9.777
10	18 34 38.16	2.3993	24 10 50.2	4.830	10	20 22 24.49	2.0923	18 6 42.1	9.853
11	18 37 1.94	2.3922	24 5 55.8	4.973	11	20 24 29.91	2.0873	17 56 48.7	9.927
12	18 39 25.35	2.3871	24 0 53.4	5.105	12	20 26 34.97	2.0814	17 46 50.8	10.000
13	18 41 48.39	2.3806	23 55 43.2	5.237	13	20 28 39.68	2.0757	17 36 48.6	10.073
14	18 44 11.05	2.3745	23 50 25.0	5.368	14	20 30 44.05	2.0699	17 26 42.0	10.145
15	18 46 33.33	2.3682	23 44 59.0	5.497	15	20 32 48.07	2.0643	17 16 31.2	10.214
16	18 48 55.23	2.3618	23 39 25.2	5.625	16	20 34 51.75	2.0585	17 6 16.3	10.283
17	18 51 16.75	2.3555	23 33 43.9	5.750	17	20 36 55.09	2.0528	16 55 57.2	10.351
18	18 53 37.89	2.3492	23 27 55.1	5.876	18	20 38 58.09	2.0472	16 45 34.1	10.417
19	18 55 58.65	2.3427	23 21 58.7	6.000	19	20 41 0.76	2.0417	16 35 7.0	10.484
20	18 58 19.02	2.3363	23 15 55.0	6.123	20	20 43 3.10	2.0362	16 24 36.0	10.549
21	19 0 39.00	2.3298	23 9 44.0	6.244	21	20 45 5.11	2.0306	16 14 1.1	10.613
22	19 2 58.59	2.3233	23 3 25.7	6.365	22	20 47 6.80	2.0250	16 3 22.5	10.673
23	19 5 17.80	2.3168	S. 22 57 0.2	6.484	23	20 49 8.17	2.0202	S. 15 52 40.2	10.735
TUESDAY 2.					THURSDAY 4.				
0	19 7 36.61	2.3103	S. 22 50 27.6	6.601	0	20 51 9.22	2.0148	S. 15 41 54.2	10.798
1	19 9 55.03	2.3037	22 43 48.0	6.717	1	20 53 9.96	2.0097	15 31 4.6	10.860
2	19 12 13.06	2.2972	22 37 1.5	6.832	2	20 55 10.39	2.0045	15 20 11.4	10.921
3	19 14 30.69	2.2906	22 30 8.1	6.947	3	20 57 10.50	1.9993	15 9 14.8	10.971
4	19 16 47.93	2.2841	22 23 7.9	7.060	4	20 59 10.30	1.9943	14 58 14.8	11.027
5	19 19 4.78	2.2775	22 16 1.0	7.170	5	21 1 9.81	1.9893	14 47 11.5	11.082
6	19 21 21.23	2.2709	22 8 47.5	7.280	6	21 3 9.02	1.9843	14 36 4.8	11.138
7	19 23 37.29	2.2643	22 1 27.4	7.388	7	21 5 7.93	1.9793	14 24 54.9	11.191
8	19 25 52.95	2.2577	21 54 0.9	7.495	8	21 7 6.56	1.9743	14 13 41.8	11.246
9	19 28 8.22	2.2512	21 46 27.9	7.602	9	21 9 4.90	1.9693	14 2 25.7	11.294
10	19 30 23.09	2.2446	21 38 48.6	7.707	10	21 11 2.95	1.9643	13 51 6.5	11.346
11	19 32 37.57	2.2381	21 31 3.0	7.810	11	21 13 0.72	1.9593	13 39 44.3	11.394
12	19 34 51.66	2.2316	21 23 11.3	7.913	12	21 14 58.22	1.9543	13 28 19.2	11.445
13	19 37 5.36	2.2250	21 15 13.5	8.016	13	21 16 55.44	1.9494	13 16 51.2	11.490
14	19 39 18.66	2.2184	21 7 9.6	8.114	14	21 18 52.39	1.9470	13 5 20.3	11.537
15	19 41 31.57	2.2120	20 58 59.8	8.211	15	21 20 49.08	1.9425	12 53 46.7	11.589
16	19 43 44.10	2.2056	20 50 44.3	8.308	16	21 22 45.50	1.9382	12 42 10.4	11.638
17	19 45 56.24	2.1991	20 42 22.9	8.404	17	21 24 41.06	1.9339	12 30 31.4	11.681
18	19 48 7.99	2.1926	20 33 55.8	8.499	18	21 26 37.57	1.9297	12 18 49.8	11.716
19	19 50 19.35	2.1861	20 25 23.0	8.592	19	21 28 33.23	1.9254	12 7 5.6	11.768
20	19 52 30.32	2.1797	20 16 44.7	8.685	20	21 30 28.64	1.9214	11 55 19.0	11.797
21	19 54 40.91	2.1733	20 8 0.8	8.776	21	21 32 23.80	1.9172	11 43 29.9	11.830
22	19 56 51.12	2.1670	19 59 11.5	8.868	22	21 34 18.72	1.9131	11 31 38.4	11.877
23	19 59 0.95	2.1607	19 50 16.8	8.955	23	21 36 13.41	1.9090	11 19 44.6	11.915
24	20 1 10.40	2.1543	S. 19 41 16.9	9.042	24	21 38 7.87	1.9057	S. 11 7 48.5	11.953

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	21 38 7.87	1.9087	S. 11° 7' 48.5	11.863	0	23 6 22.06	1.7981	S. 1° 6' 26.1	12.806
1	21 40 2.10	1.9019	10 55 50.2	11.890	1	23 8 9.74	1.7944	0 53 37.7	12.806
2	21 41 56.10	1.8983	10 43 49.7	12.836	2	23 9 57.39	1.7907	0 40 49.3	12.806
3	21 43 49.88	1.8944	10 31 47.1	12.840	3	23 11 44.99	1.7901	0 28 1.0	12.803
4	21 45 43.43	1.8908	10 19 42.5	12.864	4	23 13 32.56	1.7936	0 15 12.8	12.800
5	21 47 36.77	1.8873	10 7 35.8	12.197	5	23 15 20.10	1.7931	S. 0 2 24.8	12.796
6	21 49 29.90	1.8838	9 55 27.9	12.189	6	23 17 7.61	1.7916	N. 0 10 22.9	12.792
7	21 51 22.83	1.8805	9 43 16.7	12.190	7	23 18 55.09	1.7911	0 23 10.4	12.787
8	21 53 15.86	1.8773	9 31 4.3	12.231	8	23 20 42.54	1.7906	0 35 57.6	12.782
9	21 55 8.09	1.8738	9 18 50.1	12.261	9	23 22 29.98	1.7905	0 48 44.4	12.776
10	21 57 0.42	1.8705	9 6 34.1	12.280	10	23 24 17.41	1.7905	1 1 30.8	12.769
11	21 58 52.56	1.8674	8 54 16.4	12.290	11	23 26 4.82	1.7900	1 14 16.7	12.761
12	22 0 44.51	1.8643	8 41 57.0	12.285	12	23 27 52.21	1.7900	1 27 2.2	12.754
13	22 2 36.28	1.8613	8 29 36.0	12.269	13	23 29 39.61	1.7899	1 39 47.1	12.748
14	22 4 27.87	1.8583	8 17 13.4	12.280	14	23 31 27.00	1.7900	1 52 31.4	12.734
15	22 6 19.28	1.8554	8 4 49.3	12.418	15	23 33 14.40	1.7901	2 5 15.1	12.734
16	22 8 10.52	1.8526	7 52 23.8	12.437	16	23 35 1.81	1.7902	2 17 58.2	12.713
17	22 10 1.59	1.8498	7 39 56.8	12.460	17	23 36 49.22	1.7903	2 30 40.6	12.708
18	22 11 52.49	1.8471	7 27 28.5	12.483	18	23 38 36.65	1.7903	2 43 22.2	12.698
19	22 13 43.24	1.8445	7 14 58.8	12.495	19	23 40 24.09	1.7900	2 56 3.1	12.678
20	22 15 33.83	1.8418	7 2 27.9	12.498	20	23 42 11.56	1.7913	3 8 43.1	12.663
21	22 17 24.26	1.8393	6 49 55.7	12.546	21	23 43 59.05	1.7917	3 21 22.3	12.646
22	22 19 14.54	1.8369	6 37 22.3	12.568	22	23 45 46.56	1.7931	3 34 0.6	12.620
23	22 21 4.69	1.8346	S. 6 24 47.8	12.594	23	23 47 34.10	1.7937	N. 3 46 37.9	12.615
SATURDAY 6.					MONDAY 8.				
0	22 22 54.69	1.8322	S. 6 12 12.2	12.601	0	23 49 21.68	1.7938	N. 3 59 14.3	12.599
1	22 24 44.55	1.8299	5 59 35.6	12.619	1	23 51 9.29	1.7938	4 11 49.7	12.580
2	22 26 34.28	1.8277	5 46 57.9	12.636	2	23 52 56.94	1.7946	4 24 24.0	12.562
3	22 28 23.88	1.8256	5 34 19.3	12.661	3	23 54 44.64	1.7954	4 36 57.2	12.544
4	22 30 13.35	1.8235	5 21 39.7	12.686	4	23 56 32.39	1.7963	4 49 29.3	12.524
5	22 32 2.70	1.8214	5 8 59.3	12.690	5	23 58 20.18	1.7970	5 2 0.1	12.508
6	22 33 51.98	1.8193	4 56 18.1	12.693	6	0 0 8.03	1.7980	5 14 29.7	12.492
7	22 35 41.04	1.8176	4 43 36.1	12.706	7	0 1 55.94	1.7990	5 26 58.0	12.460
8	22 37 30.04	1.8158	4 30 53.4	12.717	8	0 3 43.91	1.8000	5 39 25.0	12.426
9	22 39 18.93	1.8141	4 18 10.0	12.730	9	0 5 31.94	1.8011	5 51 50.6	12.415
10	22 41 7.73	1.8124	4 5 25.9	12.739	10	0 7 20.04	1.8022	6 4 14.8	12.398
11	22 42 56.42	1.8108	3 52 41.3	12.748	11	0 9 8.21	1.8034	6 16 37.5	12.380
12	22 44 45.02	1.8093	3 39 56.1	12.759	12	0 10 56.45	1.8046	6 28 58.8	12.361
13	22 46 33.52	1.8076	3 27 10.3	12.768	13	0 12 44.76	1.8060	6 41 18.5	12.341
14	22 48 21.83	1.8063	3 14 24.1	12.773	14	0 14 33.16	1.8073	6 53 36.6	12.320
15	22 50 10.26	1.8049	3 1 37.5	12.780	15	0 16 21.64	1.8087	7 5 53.0	12.300
16	22 51 58.52	1.8037	2 48 50.6	12.786	16	0 18 10.21	1.8100	7 18 7.8	12.284
17	22 53 46.70	1.8026	2 36 3.1	12.791	17	0 19 58.87	1.8117	7 30 20.9	12.268
18	22 55 34.80	1.8011	2 23 15.5	12.794	18	0 21 47.62	1.8130	7 42 32.2	12.251
19	22 57 22.83	1.7999	2 10 27.6	12.799	19	0 23 36.46	1.8145	7 54 41.7	12.243
20	22 59 10.79	1.7986	1 57 39.6	12.803	20	0 25 25.40	1.8160	8 6 49.4	12.218
21	23 0 58.69	1.7979	1 44 51.3	12.806	21	0 27 14.44	1.8176	8 18 55.2	12.090
22	23 2 46.54	1.7970	1 32 3.0	12.808	22	0 29 3.59	1.8190	8 30 59.0	12.047
23	23 4 34.33	1.7960	1 19 14.6	12.808	23	0 30 52.84	1.8215	8 43 0.9	12.014
24	23 6 22.06	1.7954	S. 1 6 26.1	12.806	24	0 32 42.21	1.8237	N. 8 55 0.7	11.999

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	0 32 42.21	1.8337	N. 8° 55' 0.7	11.080	0	2 3 14.92	1.9638	N. 17° 36' 23.3	9.444
1	0 34 31.69	1.8357	9 6 58.5	11.945	1	2 5 12.86	1.9676	17 45 47.8	9.372
2	0 36 21.29	1.8376	9 18 54.1	11.809	2	2 7 11.03	1.9713	17 55 8.0	9.300
3	0 38 11.00	1.8396	9 30 47.6	11.673	3	2 9 9.42	1.9752	18 4 23.8	9.225
4	0 40 0.84	1.8317	9 42 38.8	11.535	4	2 11 8.05	1.9790	18 13 35.1	9.150
5	0 41 50.80	1.8338	9 54 27.8	11.797	5	2 13 6.90	1.9828	18 22 41.9	9.076
6	0 43 40.89	1.8359	10 6 14.5	11.759	6	2 15 5.98	1.9867	18 31 44.2	8.999
7	0 45 31.11	1.8383	10 17 58.9	11.720	7	2 17 5.30	1.9906	18 40 41.9	8.922
8	0 47 21.47	1.8404	10 29 40.9	11.680	8	2 19 4.84	1.9943	18 49 35.0	8.845
9	0 49 11.96	1.8437	10 41 20.5	11.639	9	2 21 4.62	1.9983	18 58 23.4	8.768
10	0 51 2.59	1.8461	10 52 57.6	11.597	10	2 23 4.63	2.0021	19 7 7.0	8.692
11	0 52 53.37	1.8476	11 4 32.2	11.554	11	2 25 4.87	2.0060	19 15 45.8	8.616
12	0 54 44.29	1.8499	11 16 4.2	11.511	12	2 27 5.35	2.0100	19 24 19.8	8.539
13	0 56 35.36	1.8524	11 27 33.6	11.468	13	2 29 6.07	2.0139	19 32 48.9	8.464
14	0 58 26.58	1.8549	11 39 0.4	11.424	14	2 31 7.02	2.0178	19 41 13.1	8.381
15	1 0 17.95	1.8576	11 50 24.5	11.378	15	2 33 8.21	2.0219	19 49 32.3	8.277
16	1 2 9.48	1.8603	12 1 45.8	11.332	16	2 35 9.64	2.0258	19 57 46.4	8.192
17	1 4 1.17	1.8638	12 13 4.4	11.285	17	2 37 11.30	2.0298	20 5 55.5	8.108
18	1 5 53.02	1.8666	12 24 20.1	11.238	18	2 39 13.21	2.0339	20 13 59.4	8.021
19	1 7 45.04	1.8695	12 35 33.0	11.190	19	2 41 15.35	2.0378	20 21 58.1	7.933
20	1 9 37.22	1.8711	12 46 43.0	11.143	20	2 43 17.74	2.0419	20 29 51.6	7.847
21	1 11 29.57	1.8739	12 57 50.1	11.092	21	2 45 20.37	2.0460	20 37 39.8	7.760
22	1 13 22.09	1.8767	13 8 54.1	11.041	22	2 47 23.23	2.0497	20 45 22.7	7.667
23	1 15 14.78	1.8797	N. 13 19 55.1	10.990	23	2 49 26.33	2.0537	N. 20 53 0.2	7.569
WEDNESDAY 10.					FRIDAY 12.				
0	1 17 7.65	1.8827	N 13 30 53.0	10.939	0	2 51 29.67	2.0577	N. 21 0 32.3	7.469
1	1 19 0.70	1.8857	13 41 47.7	10.886	1	2 53 33.25	2.0617	21 7 58.9	7.397
2	1 20 53.93	1.8887	13 52 39.1	10.833	2	2 55 37.08	2.0657	21 15 20.0	7.306
3	1 22 47.34	1.8918	14 3 27.3	10.778	3	2 57 41.14	2.0697	21 22 35.6	7.212
4	1 24 40.94	1.8949	14 14 12.1	10.721	4	2 59 45.44	2.0737	21 29 45.5	7.118
5	1 26 34.73	1.8980	14 24 53.7	10.664	5	3 1 49.98	2.0777	21 36 49.8	7.022
6	1 28 28.70	1.9011	14 35 31.8	10.606	6	3 3 54.76	2.0817	21 43 48.3	6.927
7	1 30 22.86	1.9043	14 46 6.6	10.550	7	3 5 59.78	2.0857	21 50 41.1	6.831
8	1 32 17.22	1.9076	14 56 37.8	10.491	8	3 8 5.04	2.0896	21 57 28.1	6.734
9	1 34 11.77	1.9111	15 7 5.5	10.432	9	3 10 10.53	2.0936	22 4 9.2	6.636
10	1 36 6.53	1.9143	15 17 29.6	10.372	10	3 12 16.26	2.0975	22 10 44.5	6.538
11	1 38 1.48	1.9176	15 27 50.1	10.310	11	3 14 22.23	2.1015	22 17 13.8	6.439
12	1 39 56.64	1.9210	15 38 6.7	10.249	12	3 16 28.44	2.1054	22 23 37.2	6.339
13	1 41 52.00	1.9243	15 48 19.8	10.186	13	3 18 34.88	2.1093	22 29 54.5	6.238
14	1 43 47.56	1.9277	15 58 29.1	10.123	14	3 20 41.56	2.1133	22 36 5.8	6.136
15	1 45 43.33	1.9313	16 8 34.5	10.058	15	3 22 48.46	2.1170	22 42 10.9	6.034
16	1 47 39.32	1.9349	16 18 36.1	9.994	16	3 24 55.60	2.1209	22 48 9.9	5.931
17	1 49 35.52	1.9384	16 28 33.8	9.928	17	3 27 2.97	2.1247	22 54 2.7	5.827
18	1 51 31.93	1.9419	16 38 27.5	9.860	18	3 29 10.56	2.1284	22 59 49.2	5.723
19	1 53 28.55	1.9454	16 48 17.1	9.793	19	3 31 18.38	2.1322	23 5 29.5	5.618
20	1 55 25.38	1.9490	16 58 2.7	9.726	20	3 33 26.44	2.1363	23 11 3.4	5.512
21	1 57 22.43	1.9527	17 7 44.1	9.655	21	3 35 34.73	2.1399	23 16 31.0	5.405
22	1 59 19.71	1.9564	17 17 21.4	9.586	22	3 37 43.23	2.1435	23 21 52.1	5.298
23	2 1 17.20	1.9601	17 26 54.5	9.515	23	3 39 51.95	2.1473	23 27 6.8	5.190
24	2 3 14.92	1.9638	N. 17 36 23.3	9.444	24	3 42 0.89	2.1509	N. 23 32 15.0	5.081

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	3 42 0.89	2.1808	N.23° 32' 15.0	5.081	0	5 28 42.05	2.2744	N.25° 19' 25.9	0.708
1	3 44 10.05	2.1845	23 37 16.6	4.971	1	5 30 58.55	2.2766	25 18 34.0	0.980
2	3 46 19.43	2.1882	23 42 11.6	4.861	2	5 33 15.12	2.2787	25 17 34.3	1.061
3	3 48 29.03	2.1918	23 47 0.0	4.750	3	5 35 31.75	2.2778	25 16 26.6	1.194
4	3 50 38.84	2.1953	23 51 41.7	4.639	4	5 37 48.45	2.2788	25 15 11.0	1.326
5	3 52 48.86	2.1988	23 56 16.7	4.528	5	5 40 5.21	2.2797	25 13 47.4	1.459
6	3 54 59.09	2.1793	24 0 44.9	4.413	6	5 42 22.02	2.2805	25 12 15.9	1.591
7	3 57 9.53	2.1757	24 5 6.3	4.300	7	5 44 38.87	2.2818	25 10 36.4	1.728
8	3 59 20.18	2.1793	24 9 20.9	4.185	8	5 46 55.77	2.2830	25 8 48.9	1.860
9	4 1 31.03	2.1834	24 13 28.6	4.070	9	5 49 12.71	2.2837	25 6 53.4	1.993
10	4 3 42.07	2.1867	24 17 29.4	3.955	10	5 51 29.69	2.2833	25 4 50.0	2.125
11	4 5 53.32	2.1891	24 21 23.2	3.835	11	5 53 46.71	2.2839	25 2 38.7	2.260
12	4 8 4.76	2.1933	24 25 10.1	3.723	12	5 56 3.76	2.2843	25 0 19.4	2.391
13	4 10 16.40	2.1965	24 28 50.0	3.606	13	5 58 20.83	2.2847	24 57 52.1	2.521
14	4 12 28.22	2.1986	24 32 22.8	3.487	14	6 0 37.93	2.2851	24 55 16.8	2.656
15	4 14 40.23	2.2017	24 35 48.5	3.369	15	6 2 55.04	2.2853	24 52 33.5	2.788
16	4 16 52.43	2.2048	24 39 7.1	3.250	16	6 5 12.17	2.2856	24 49 42.2	2.921
17	4 19 4.81	2.2078	24 42 18.6	3.131	17	6 7 29.31	2.2858	24 46 42.9	3.056
18	4 21 17.37	2.2108	24 45 22.9	3.010	18	6 9 46.46	2.2859	24 43 35.6	3.180
19	4 23 40.11	2.2137	24 48 19.9	2.890	19	6 12 3.62	2.2860	24 40 20.3	3.320
20	4 25 43.02	2.2166	24 51 9.7	2.768	20	6 14 20.78	2.2860	24 36 57.1	3.453
21	4 27 56.10	2.2194	24 53 52.1	2.646	21	6 16 37.94	2.2860	24 33 25.9	3.586
22	4 30 9.35	2.2223	24 56 27.3	2.524	22	6 18 55.10	2.2858	24 29 46.8	3.718
23	4 32 22.77	2.2250	N.24 58 55.1	2.403	23	6 21 12.24	2.2856	N.24 25 59.7	3.851
SUNDAY 14.					TUESDAY 16.				
0	4 34 36.35	2.2277	N.25 1 15.6	2.279	0	6 23 29.37	2.2854	N.24 22 4.6	3.984
1	4 36 50.09	2.2303	25 3 28.6	2.155	1	6 25 46.49	2.2853	24 18 1.6	4.116
2	4 39 3.99	2.2330	25 5 34.2	2.030	2	6 28 3.59	2.2848	24 13 50.7	4.247
3	4 41 18.04	2.2353	25 7 32.3	1.906	3	6 30 20.67	2.2845	24 9 31.9	4.380
4	4 43 32.23	2.2378	25 9 23.0	1.781	4	6 32 37.73	2.2841	24 5 5.1	4.515
5	4 45 46.57	2.2403	25 11 6.1	1.656	5	6 34 54.76	2.2836	24 0 30.4	4.644
6	4 48 1.06	2.2428	25 12 41.7	1.530	6	6 37 11.76	2.2830	23 55 47.8	4.775
7	4 50 15.68	2.2445	25 14 9.7	1.408	7	6 39 28.72	2.2823	23 50 57.4	4.906
8	4 52 30.44	2.2471	25 15 30.1	1.276	8	6 41 45.64	2.2817	23 45 59.0	5.038
9	4 54 45.33	2.2493	25 16 42.9	1.149	9	6 44 2.52	2.2810	23 40 52.8	5.169
10	4 57 0.35	2.2514	25 17 48.0	1.021	10	6 46 19.36	2.2803	23 35 38.7	5.300
11	4 59 15.50	2.2534	25 18 45.5	0.894	11	6 48 36.16	2.2798	23 30 16.8	5.430
12	5 1 30.76	2.2553	25 19 35.3	0.766	12	6 50 52.91	2.2788	23 24 47.1	5.560
13	5 3 46.14	2.2573	25 20 17.4	0.636	13	6 53 9.61	2.2778	23 19 9.6	5.689
14	5 6 1.63	2.2593	25 20 51.7	0.507	14	6 55 26.25	2.2769	23 13 24.4	5.818
15	5 8 17.24	2.2611	25 21 18.3	0.378	15	6 57 42.84	2.2760	23 7 31.4	5.947
16	5 10 32.96	2.2628	25 21 37.1	0.248	16	6 59 59.37	2.2750	23 1 30.7	6.075
17	5 12 48.78	2.2644	25 21 48.1	0.118	17	7 2 15.84	2.2740	22 55 22.3	6.204
18	5 15 4.69	2.2660	25 21 51.3	0.011	18	7 4 32.25	2.2730	22 49 6.2	6.331
19	5 17 20.70	2.2675	25 21 46.7	0.140	19	7 6 48.60	2.2718	22 42 42.5	6.459
20	5 19 36.80	2.2691	25 21 34.3	0.272	20	7 9 4.87	2.2705	22 36 11.1	6.586
21	5 21 52.99	2.2705	25 21 14.0	0.408	21	7 11 21.07	2.2694	22 29 32.1	6.710
22	5 24 9.26	2.2719	25 20 45.9	0.536	22	7 13 37.20	2.2683	22 22 45.5	6.840
23	5 26 25.62	2.2733	25 20 9.8	0.666	23	7 15 53.27	2.2672	22 15 51.3	6.966
24	5 28 42.05	2.2744	N.25 19 25.9	0.798	24	7 18 9.27	2.2659	N.22 8 49.5	7.091

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.	Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	7 18 9.27	2.2669	N.22° 8' 49.5	7.001	0	9 5 13.45	2.1970	N.14° 14' 39.1	12.397
1	7 20 25.18	2.2668	22 1 40.2	7.317	1	9 7 25.27	2.1969	14 2 12.5	12.406
2	7 22 41.02	2.2667	21 54 23.4	7.541	2	9 9 36.96	2.1968	13 49 40.5	12.478
3	7 24 56.77	2.2666	21 46 59.2	7.466	3	9 11 48.62	2.1968	13 37 3.1	12.607
4	7 27 12.44	2.2665	21 39 27.6	7.898	4	9 14 0.22	2.1969	13 24 20.4	12.755
5	7 29 28.03	2.2663	21 31 48.6	7.713	5	9 16 11.77	2.1969	13 11 32.4	12.843
6	7 31 43.54	2.2678	21 24 2.1	7.686	6	9 18 23.26	2.1911	12 58 39.2	12.980
7	7 33 58.96	2.2663	21 16 8.4	7.666	7	9 20 34.70	2.1968	12 45 40.8	12.015
8	7 36 14.30	2.2549	21 8 7.3	8.079	8	9 22 46.09	2.1968	12 32 37.3	12.180
9	7 38 29.55	2.2534	20 59 58.9	8.300	9	9 24 57.44	2.1967	12 19 28.8	12.163
10	7 40 44.71	2.2519	20 51 43.3	8.330	10	9 27 8.74	2.1969	12 6 15.3	12.296
11	7 42 59.78	2.2508	20 43 20.4	8.440	11	9 29 20.00	2.1973	11 52 56.9	12.347
12	7 45 14.76	2.2499	20 34 50.4	8.600	12	9 31 31.22	2.1967	11 39 33.6	12.437
13	7 47 29.65	2.2478	20 26 13.2	8.673	13	9 33 42.41	2.1962	11 26 5.6	12.606
14	7 49 44.44	2.2469	20 17 28.9	8.797	14	9 35 53.56	2.1966	11 12 32.8	12.665
15	7 51 59.15	2.2443	20 8 37.5	8.916	15	9 38 4.68	2.1962	10 58 55.3	12.692
16	7 54 13.76	2.2438	19 59 39.0	9.088	16	9 40 15.78	2.1946	10 45 13.3	12.737
17	7 56 28.28	2.2413	19 50 33.5	9.140	17	9 42 26.85	2.1948	10 31 26.8	12.813
18	7 58 42.70	2.2398	19 41 21.1	9.285	18	9 44 37.90	2.1940	10 17 35.8	12.926
19	8 0 57.03	2.2381	19 32 1.7	9.380	19	9 46 48.93	2.1967	10 3 40.5	12.966
20	8 3 11.27	2.2365	19 22 35.5	9.484	20	9 48 59.95	2.1966	9 49 40.8	14.000
21	8 5 25.41	2.2349	19 13 2.4	9.603	21	9 51 10.95	2.1968	9 35 36.9	14.100
22	8 7 39.46	2.2334	19 3 22.5	9.731	22	9 53 21.95	2.1968	9 21 28.8	14.168
23	8 9 53.42	2.2320	N.18° 53' 35.8	9.884	23	9 55 32.95	2.1968	N. 9 7 16.6	14.297
THURSDAY 18.					SATURDAY 20.				
0	8 12 7.28	2.2308	N.18° 43' 42.4	9.945	0	9 57 43.94	2.1962	N. 8 53 0.3	14.364
1	8 14 21.04	2.2295	18 33 42.3	10.097	1	9 59 54.93	2.1962	8 38 40.1	14.370
2	8 16 34.71	2.2271	18 23 35.5	10.168	2	10 2 5.98	2.1963	8 24 15.9	14.486
3	8 18 48.29	2.2246	18 13 32.1	10.377	3	10 4 16.93	2.1966	8 9 47.9	14.607
4	8 21 1.78	2.2240	18 3 2.2	10.386	4	10 6 27.95	2.1966	7 55 16.2	14.660
5	8 23 15.17	2.2235	17 52 35.8	10.484	5	10 8 38.99	2.1941	7 40 40.8	14.619
6	8 25 28.48	2.2210	17 42 2.9	10.601	6	10 10 50.04	2.1944	7 26 1.9	14.676
7	8 27 41.69	2.2184	17 31 33.6	10.708	7	10 13 1.12	2.1948	7 11 19.4	14.736
8	8 29 54.81	2.2179	17 20 37.9	10.814	8	10 15 12.22	2.1962	6 56 33.5	14.792
9	8 32 7.84	2.2164	17 9 45.9	10.919	9	10 17 23.35	2.1966	6 41 44.2	14.849
10	8 34 20.78	2.2160	16 58 47.6	11.024	10	10 19 34.52	2.1964	6 26 51.6	14.902
11	8 36 33.64	2.2136	16 47 43.0	11.127	11	10 21 45.72	2.1971	6 11 55.9	14.956
12	8 38 46.41	2.2122	16 36 32.3	11.280	12	10 23 56.97	2.1976	5 56 57.0	15.007
13	8 40 59.10	2.2106	16 25 15.4	11.331	13	10 26 8.26	2.1966	5 41 55.0	15.067
14	8 43 11.70	2.2098	16 13 52.5	11.422	14	10 28 19.60	2.1966	5 26 50.1	15.105
15	8 45 24.22	2.2080	16 2 23.5	11.523	15	10 30 31.00	2.1964	5 11 42.3	15.158
16	8 47 36.66	2.2067	15 50 48.5	11.636	16	10 32 42.45	2.1913	4 56 31.7	15.189
17	8 49 49.02	2.2063	15 39 7.6	11.769	17	10 34 53.96	2.1924	4 41 18.4	15.244
18	8 52 1.30	2.2041	15 27 20.8	11.898	18	10 37 5.54	2.1966	4 26 2.4	15.297
19	8 54 13.51	2.2026	15 15 28.1	11.986	19	10 39 17.18	2.1967	4 10 43.9	15.369
20	8 56 25.64	2.2016	15 3 29.7	12.030	20	10 41 28.90	2.1966	3 55 22.9	15.376
21	8 58 37.70	2.2008	14 51 25.5	12.116	21	10 43 40.69	2.1973	3 39 59.5	15.406
22	9 0 49.08	2.1998	14 39 15.7	12.210	22	10 45 52.56	2.1966	3 24 33.9	15.445
23	9 3 1.60	2.1981	14 27 0.2	12.304	23	10 48 4.52	2.2001	3 9 6.0	15.461
24	9 5 13.45	2.1970	N.14° 14' 39.1	12.397	24	10 50 16.57	2.2016	N. 2 53 36.1	15.515

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	10 50 16.57	2.2016	N. 2° 53' 36.1	15.516	0	12 30 0.17	2.2620	S. 9° 39' 14.9	15.151
1	10 52 28.71	2.2023	2 38 4.1	15.548	1	12 41 21.55	2.2627	9 54 22.4	15.007
2	10 54 40.95	2.2048	2 22 30.3	15.579	2	12 43 43.21	2.2633	10 9 26.6	15.041
3	10 56 53.29	2.2066	2 6 54.6	15.610	3	12 46 5.14	2.2679	10 24 27.4	14.983
4	10 59 5.73	2.2083	1 51 17.1	15.638	4	12 48 27.36	2.2737	10 39 24.6	14.923
5	11 1 18.28	2.2102	1 35 38.0	15.665	5	12 50 49.87	2.2777	10 54 18.1	14.860
6	11 3 30.95	2.2121	1 19 57.3	15.690	6	12 53 12.68	2.2826	11 9 7.8	14.795
7	11 5 43.73	2.2140	1 4 15.1	15.714	7	12 55 35.77	2.2873	11 23 53.5	14.738
8	11 7 56.63	2.2161	0 48 31.5	15.735	8	12 57 59.16	2.2923	11 38 35.2	14.680
9	11 10 9.66	2.2183	0 32 46.7	15.756	9	13 0 22.65	2.2973	11 53 12.7	14.620
10	11 12 22.82	2.2205	0 17 0.7	15.775	10	13 2 46.84	2.3023	12 7 45.9	14.515
11	11 14 36.12	2.2228	N. 0 1 13.7	15.791	11	13 5 11.12	2.3073	12 22 14.6	14.440
12	11 16 49.55	2.2251	S. 0 14 34.2	15.807	12	13 7 35.71	2.3124	12 36 38.8	14.364
13	11 19 3.13	2.2276	0 30 23.1	15.821	13	13 10 0.61	2.3175	12 50 58.3	14.288
14	11 21 16.85	2.2300	0 46 12.8	15.833	14	13 12 25.81	2.3226	13 5 13.0	14.203
15	11 23 30.73	2.2327	1 2 3.1	15.843	15	13 14 51.32	2.3277	13 19 22.7	14.120
16	11 25 44.77	2.2353	1 17 54.0	15.852	16	13 17 17.14	2.3328	13 33 27.4	14.035
17	11 27 58.97	2.2380	1 33 45.4	15.859	17	13 19 43.27	2.3381	13 47 26.9	13.947
18	11 30 13.33	2.2408	1 49 37.1	15.865	18	13 22 9.71	2.3432	14 1 21.1	13.858
19	11 32 27.86	2.2435	2 5 29.2	15.869	19	13 24 36.46	2.3484	14 15 9.9	13.766
20	11 34 42.55	2.2464	2 21 21.4	15.870	20	13 27 3.52	2.3537	14 28 53.1	13.672
21	11 36 57.43	2.2494	2 37 13.6	15.870	21	13 29 30.90	2.3589	14 42 30.6	13.576
22	11 39 12.49	2.2525	2 53 5.8	15.868	22	13 31 58.59	2.3641	14 56 2.3	13.479
23	11 41 27.73	2.2556	S. 3 8 57.8	15.863	23	13 34 26.59	2.3693	S. 15 9 28.1	13.379
MONDAY 22.					WEDNESDAY 24.				
0	11 43 43.16	2.2588	S. 3 24 49.6	15.850	0	13 36 54.91	2.3745	S. 15 22 47.8	13.278
1	11 45 58.79	2.2621	3 40 41.0	15.832	1	13 39 23.54	2.3798	15 36 1.3	13.173
2	11 48 14.61	2.2663	3 56 31.9	15.813	2	13 41 52.49	2.3851	15 49 8.5	13.066
3	11 50 30.63	2.2687	4 12 22.2	15.822	3	13 44 21.75	2.3908	16 2 9.3	12.958
4	11 52 46.85	2.2721	4 28 11.8	15.830	4	13 46 51.32	2.3966	16 15 3.5	12.847
5	11 55 3.28	2.2767	4 44 0.6	15.836	5	13 49 21.21	2.4027	16 27 51.0	12.735
6	11 57 19.93	2.2793	4 59 48.5	15.798	6	13 51 51.40	2.4088	16 40 31.8	12.621
7	11 59 36.79	2.2828	5 15 35.3	15.770	7	13 54 21.91	2.4111	16 53 5.6	12.506
8	12 1 53.87	2.2865	5 31 20.9	15.738	8	13 56 52.73	2.4163	17 5 32.5	12.388
9	12 4 11.17	2.2903	5 47 5.3	15.727	9	13 59 23.68	2.4214	17 17 52.2	12.268
10	12 6 28.70	2.2943	6 2 48.2	15.703	10	14 1 55.30	2.4268	17 30 4.7	12.146
11	12 8 46.47	2.2982	6 18 29.6	15.675	11	14 4 27.04	2.4316	17 42 9.8	12.023
12	12 11 4.48	2.3023	6 34 9.3	15.647	12	14 6 59.08	2.4366	17 54 7.4	11.896
13	12 13 22.74	2.3062	6 49 47.3	15.617	13	14 9 31.43	2.4416	18 5 57.4	11.760
14	12 15 41.23	2.3101	7 5 28.4	15.585	14	14 12 4.07	2.4469	18 17 39.7	11.616
15	12 17 59.95	2.3141	7 20 57.5	15.550	15	14 14 37.01	2.4515	18 29 14.2	11.509
16	12 20 18.92	2.3183	7 36 29.5	15.516	16	14 17 10.25	2.4564	18 40 40.8	11.376
17	12 22 38.15	2.3227	7 51 59.3	15.478	17	14 19 43.78	2.4613	18 51 59.3	11.240
18	12 24 57.65	2.3271	8 7 26.7	15.436	18	14 22 17.60	2.4661	19 3 9.7	11.104
19	12 27 17.40	2.3314	8 22 51.7	15.389	19	14 24 51.71	2.4709	19 14 11.8	10.966
20	12 29 37.42	2.3368	8 38 14.0	15.340	20	14 27 26.10	2.4755	19 25 5.5	10.823
21	12 31 57.70	2.3408	8 53 33.6	15.303	21	14 30 0.77	2.4801	19 35 50.8	10.683
22	12 34 18.26	2.3448	9 8 50.4	15.256	22	14 32 35.71	2.4847	19 46 27.5	10.539
23	12 36 38.06	2.3493	9 24 4.2	15.204	23	14 35 10.93	2.4892	19 56 55.5	10.394
24	12 39 0.17	2.3539	S. 9 39 14.9	15.151	24	14 37 46.41	2.4938	S. 20 7 14.8	10.247

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	14 37 46.41	2.6936	S. 20° 7' 14.8	10.347	0	16 45 21.85	2.6714	S. 25° 6' 53.9	1.966
1	14 40 22.16	2.6980	20 17 25.2	10.099	1	16 48 2.07	2.6693	25 8 45.7	1.773
2	14 42 58.17	2.6923	20 27 26.7	9.849	2	16 50 42.17	2.6672	25 10 26.7	1.581
3	14 45 34.43	2.6964	20 37 19.1	9.797	3	16 53 22.14	2.6650	25 11 56.8	1.411
4	14 48 10.94	2.6106	20 47 2.4	9.646	4	16 56 1.97	2.6626	25 13 16.1	1.230
5	14 50 47.70	2.6147	20 56 36.5	9.490	5	16 58 41.65	2.6600	25 14 24.5	1.049
6	14 53 24.70	2.6186	21 6 1.2	9.333	6	17 1 21.17	2.6572	25 15 22.0	0.860
7	14 56 1.93	2.6223	21 15 16.5	9.175	7	17 4 0.52	2.6543	25 16 8.8	0.680
8	14 58 39.38	2.6261	21 24 22.3	9.017	8	17 6 39.69	2.6513	25 16 44.8	0.510
9	15 1 17.06	2.6298	21 33 18.6	8.857	9	17 9 18.68	2.6482	25 17 10.1	0.331
10	15 3 54.96	2.6334	21 42 5.2	8.696	10	17 11 57.47	2.6448	25 17 24.6	0.153
11	15 6 33.07	2.6368	21 50 42.1	8.532	11	17 14 36.05	2.6413	25 17 28.5	0.022
12	15 9 11.38	2.6403	21 59 9.1	8.368	12	17 17 14.42	2.6377	25 17 21.9	0.196
13	15 11 49.89	2.6434	22 7 26.3	8.203	13	17 19 52.57	2.6339	25 17 4.7	0.374
14	15 14 28.59	2.6468	22 15 33.5	8.036	14	17 22 30.49	2.6301	25 16 37.0	0.549
15	15 17 7.48	2.6497	22 23 30.7	7.869	15	17 25 8.18	2.6261	25 15 58.8	0.722
16	15 19 46.55	2.6526	22 31 17.8	7.700	16	17 27 45.62	2.6219	25 15 10.2	0.896
17	15 22 25.79	2.6553	22 38 54.7	7.530	17	17 30 22.81	2.6176	25 14 11.2	1.069
18	15 25 5.19	2.6579	22 46 21.4	7.369	18	17 32 59.74	2.6132	25 13 2.0	1.239
19	15 27 44.74	2.6604	22 53 37.8	7.196	19	17 35 36.39	2.6086	25 11 42.5	1.410
20	15 30 24.44	2.6626	23 0 43.8	7.014	20	17 38 12.76	2.6038	25 10 12.8	1.580
21	15 33 4.28	2.6652	23 7 39.5	6.840	21	17 40 48.85	2.6001	25 8 32.9	1.748
22	15 35 44.26	2.6673	23 14 24.7	6.666	22	17 43 24.65	2.5963	25 6 43.0	1.915
23	15 38 24.36	2.6693	S. 23° 20' 59.4	6.490	23	17 46 0.15	2.5901	S. 25° 4' 43.1	2.081
FRIDAY 26.					SUNDAY 28.				
0	15 41 4.57	2.6711	S. 23° 27' 23.5	6.314	0	17 48 35.34	2.5889	S. 25° 2' 33.2	2.247
1	15 43 44.89	2.6736	23 33 37.1	6.137	1	17 51 10.22	2.5796	25 0 13.4	2.411
2	15 46 25.31	2.6744	23 39 40.0	5.969	2	17 53 44.77	2.5731	24 57 43.8	2.573
3	15 49 5.82	2.6766	23 45 32.2	5.780	3	17 56 18.99	2.5677	24 55 4.5	2.736
4	15 51 46.41	2.6772	23 51 13.7	5.601	4	17 58 52.89	2.5621	24 52 15.5	2.896
5	15 54 27.08	2.6783	23 56 44.4	5.421	5	18 1 26.44	2.5563	24 49 16.9	3.056
6	15 57 7.81	2.6798	24 2 4.3	5.241	6	18 3 59.65	2.5506	24 46 8.7	3.215
7	15 59 48.60	2.6802	24 7 13.4	5.060	7	18 6 32.51	2.5446	24 42 51.1	3.370
8	16 2 29.44	2.6810	24 12 11.6	4.879	8	18 9 5.00	2.5386	24 39 24.2	3.526
9	16 5 10.32	2.6816	24 16 58.9	4.697	9	18 11 37.13	2.5324	24 35 47.9	3.681
10	16 7 51.23	2.6820	24 21 35.3	4.515	10	18 14 8.89	2.5263	24 32 2.4	3.836
11	16 10 32.16	2.6822	24 26 0.8	4.334	11	18 16 40.28	2.5201	24 28 7.7	3.990
12	16 13 13.09	2.6823	24 30 15.4	4.151	12	18 19 11.30	2.5138	24 24 4.0	4.146
13	16 15 54.03	2.6823	24 34 19.0	3.970	13	18 21 41.93	2.5073	24 19 51.3	4.303
14	16 18 34.96	2.6821	24 38 11.6	3.785	14	18 24 12.17	2.5007	24 15 29.7	4.434
15	16 21 15.88	2.6818	24 41 53.3	3.603	15	18 26 42.02	2.4942	24 10 59.2	4.580
16	16 23 56.78	2.6813	24 45 24.0	3.419	16	18 29 11.47	2.4875	24 6 20.0	4.736
17	16 26 37.64	2.6806	24 48 43.6	3.235	17	18 31 40.52	2.4807	24 1 32.1	4.889
18	16 29 18.46	2.6798	24 51 52.3	3.053	18	18 34 9.16	2.4740	23 56 35.7	5.010
19	16 31 59.22	2.6788	24 54 50.0	2.870	19	18 36 37.40	2.4673	23 51 30.8	5.151
20	16 34 39.91	2.6776	24 57 36.8	2.687	20	18 39 5.22	2.4603	23 46 17.5	5.290
21	16 37 20.53	2.6762	25 0 12.5	2.503	21	18 41 32.63	2.4533	23 40 55.9	5.429
22	16 40 1.06	2.6748	25 2 37.2	2.320	22	18 43 59.62	2.4464	23 35 26.0	5.565
23	16 42 41.50	2.6733	25 4 51.0	2.138	23	18 46 26.19	2.4393	23 29 48.1	5.700
24	16 45 21.85	2.6714	S. 25° 6' 53.9	1.965	24	18 48 52.33	2.4321	S. 23° 24' 2.0	5.834

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					TUESDAY 30.				
0	18 48 52.33	2.4331	S. 23° 24'	2.0	0	19 45 8.24	2.5567	S. 20° 29'	10.0
1	18 51 18.04	2.4360	23 18 8.0	5.866	1	19 47 23.37	2.5466	20 20 31.4	8.891
2	18 53 43.33	2.4378	23 12 6.0	6.066	2	19 49 38.06	2.5412	20 11 47.0	8.787
3	18 56 8.18	2.4406	23 5 56.4	6.236	3	19 51 52.31	2.5340	20 2 56.9	8.681
4	18 58 32.60	2.4434	22 59 38.8	6.366	4	19 54 6.14	2.5267	19 54 1.2	8.573
5	19 0 56.59	2.4462	22 53 13.7	6.480	5	19 56 19.51	2.5188	19 45 0.1	8.464
6	19 3 20.14	2.4493	22 46 41.1	6.606	6	19 58 32.46	2.5122	19 35 53.5	8.356
7	19 5 43.24	2.4514	22 40 1.1	6.738	7	20 0 44.98	2.5061	19 26 41.5	8.248
8	19 8 5.91	2.4543	22 33 13.7	6.860	8	20 2 57.07	2.4990	19 17 24.3	8.130
9	19 10 28.14	2.4568	22 26 19.0	6.970	9	20 5 8.74	2.4909	19 8 1.9	8.016
10	19 12 49.92	2.4598	22 19 17.2	7.080	10	20 7 19.98	2.4838	18 58 34.5	7.909
11	19 15 11.26	2.4620	22 12 8.3	7.206	11	20 9 30.80	2.4767	18 49 2.0	7.803
12	19 17 32.16	2.4646	22 4 52.5	7.321	12	20 11 41.19	2.4697	18 39 24.5	7.696
13	19 19 52.61	2.4672	21 57 29.7	7.435	13	20 13 51.16	2.4627	18 29 42.2	7.584
14	19 22 12.62	2.4698	21 50 0.2	7.547	14	20 16 0.72	2.4559	18 19 55.2	7.473
15	19 24 32.18	2.4723	21 42 24.0	7.660	15	20 18 9.87	2.4491	18 10 3.4	7.360
16	19 26 51.30	2.4749	21 34 41.1	7.769	16	20 20 18.61	2.4423	18 0 7.1	7.246
17	19 29 9.97	2.4775	21 26 51.7	7.877	17	20 22 26.94	2.4356	17 50 6.2	7.131
18	19 31 28.20	2.4801	21 18 55.8	7.984	18	20 24 34.87	2.4288	17 40 0.9	7.016
19	19 33 45.98	2.4827	21 10 53.6	8.089	19	20 26 42.40	2.4222	17 29 51.2	6.901
20	19 36 3.32	2.4853	21 2 45.1	8.193	20	20 28 49.54	2.4157	17 19 37.2	6.786
21	19 38 20.22	2.4779	20 54 30.4	8.295	21	20 30 56.28	2.4090	17 9 19.0	6.671
22	19 40 36.67	2.4706	20 46 9.6	8.396	22	20 33 2.63	2.4026	16 58 56.6	6.556
23	19 42 52.68	2.4631	20 37 42.8	8.496	23	20 35 8.60	2.3963	16 48 30.2	6.441
24	19 45 8.24	2.4557	S. 20° 29' 10.0	8.596	24	20 37 14.18	2.3899	S. 16° 37' 59.7	6.321

PHASES OF THE MOON.

☾ Last Quarter,	d	h	m
● New Moon,	1	18	24.1
☾ First Quarter,	9	18	55.7
○ Full Moon,	17	18	45.5
	24	10	23.6

☾ Apogee,	d	h
☾ Perigee,	9	15.3
	23	22.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Spica W.	70° 23' 47"	2680	72° 4' 18"	2647	73° 44' 26"	2664	75° 24' 10"	2681
	Antares W.	24 40 29	2629	26 21 2	2646	28 1 12	2663	29 40 59	2679
	Fomalhaut E.	61 13 0	2668	59 44 30	2120	58 16 45	2158	56 49 46	2196
	α Pegasi E.	80 18 43	2678	78 41 33	2697	77 4 49	2716	75 28 30	2735
	SUN E.	99 23 49	2673	97 50 55	2691	96 18 25	2909	94 46 18	2937
2	Spica W.	83 37 13	2682	85 14 44	2677	86 51 55	2692	88 28 45	2707
	Antares W.	37 54 21	2686	39 31 57	2674	41 9 12	2689	42 46 7	2704
	Fomalhaut E.	49 47 33	2434	48 25 55	2490	47 5 20	2560	45 45 51	2613
	α Pegasi E.	67 33 19	2633	65 59 34	2663	64 26 15	2673	62 53 22	2684
	SUN E.	87 11 22	2615	85 41 28	2693	84 11 55	2649	82 42 43	2665
3	Spica W.	96 28 5	2778	98 3 2	2791	99 37 42	2804	101 12 5	2817
	Antares W.	50 45 53	2774	52 20 55	2798	53 55 41	2799	55 30 10	2813
	Fomalhaut E.	39 27 17	4091	38 15 58	4126	37 6 21	4241	35 58 34	4370
	α Pegasi E.	55 15 34	2691	53 45 22	2694	52 15 39	2647	50 46 24	2671
	SUN E.	75 21 33	2143	73 54 15	2187	72 27 14	2171	71 0 30	2186
4	Antares W.	63 18 37	2670	64 51 34	2680	66 24 18	2691	67 56 49	2691
	α Pegasi E.	43 27 50	2206	42 1 48	2227	40 36 23	2271	39 11 38	2309
	SUN E.	63 50 53	2280	62 25 43	2363	61 0 48	2376	59 36 7	2396
5	Antares W.	75 36 21	2646	77 7 42	2654	78 38 53	2662	80 9 54	2668
	α Aquilæ W.	34 30 24	2433	35 21 55	2234	36 15 36	2094	37 11 18	4932
	SUN E.	52 35 49	2336	51 12 22	2348	49 49 6	2358	48 26 1	2367
6	Antares W.	87 42 48	2691	89 12 50	2697	90 43 3	2613	92 13 0	2618
	α Aquilæ W.	42 14 41	4440	43 19 26	4306	44 25 18	4300	45 32 11	4239
	SUN E.	41 33 13	2411	40 11 9	2420	38 49 15	2428	37 27 30	2437
7	α Aquilæ W.	51 19 10	4011	52 30 39	2976	53 42 42	2644	54 55 17	2615
	SUN E.	30 41 13	2481	29 20 28	2491	27 59 54	2602	26 39 32	2613
12	SUN W.	24 29 23	2207	25 49 39	2406	27 10 8	2486	28 30 49	2473
	Pollux E.	64 19 52	2669	62 51 21	2679	61 22 46	2677	59 54 8	2674
	Jupiter E.	90 14 37	2680	88 45 26	2646	87 16 10	2643	85 46 50	2638
	Regulus E.	101 9 50	2661	99 40 40	2647	98 11 26	2643	96 42 7	2638
	Saturn E.	106 12 6	2649	104 42 54	2646	103 13 37	2643	101 44 16	2637
13	SUN W.	35 17 9	2424	36 38 58	2415	38 0 57	2407	39 23 6	2396
	Pollux E.	52 30 6	2669	51 1 6	2666	49 32 2	2663	48 2 54	2663
	Jupiter E.	78 18 50	2615	76 48 56	2609	75 18 55	2604	73 48 47	2599
	Regulus E.	89 14 9	2614	87 44 14	2609	86 14 13	2604	84 44 5	2597
	Saturn E.	94 16 7	2614	92 46 11	2607	91 16 7	2601	89 45 56	2596
14	SUN W.	46 16 28	2281	47 39 41	2241	49 3 5	2232	50 26 40	2231
	Pollux E.	40 36 15	2684	39 6 45	2623	37 37 12	2680	36 7 37	2680
	Jupiter E.	66 16 18	2666	64 45 23	2666	63 14 18	2661	61 43 4	2643
	Regulus E.	77 11 26	2664	75 40 28	2646	74 9 20	2649	72 38 3	2640
	Saturn E.	82 13 5	2662	80 42 5	2646	79 10 56	2647	77 39 37	2639
15	SUN W.	57 27 38	2267	58 52 28	2245	60 17 32	2243	61 42 50	2231
	Aldebaran W.	16 50 18	2626	18 10 15	2408	19 32 28	2211	20 56 27	2239
	Pollux E.	28 39 41	2687	27 10 14	2644	25 40 56	2665	24 11 51	2699
	Jupiter E.	54 4 19	2691	52 32 1	2691	50 59 30	2681	49 26 47	2673

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Spica W.	77° 3' 31"	2607	78° 42' 30"	2614	80° 21' 6"	2620	81° 59' 20"	2646
	Antares W.	31 20 23	2606	32 59 25	2611	34 38 5	2626	36 16 24	2643
	Fomalhaut E.	55 23 35	2641	53 58 14	2626	52 33 45	2632	51 10 11	2681
	α Pegasi E.	73 52 37	2764	72 17 9	2774	70 42 7	2708	69 7 30	2613
	SUN E.	93 14 34	2646	91 43 13	2663	90 12 14	2661	88 41 37	2696
2	Spica W.	90 5 15	2722	91 41 26	2726	93 17 18	2750	94 52 51	2765
	Antares W.	44 22 42	2718	45 58 58	2723	47 34 55	2747	49 10 33	2760
	Fomalhaut E.	44 27 31	2692	43 10 25	2766	41 54 37	2636	40 40 12	2624
	α Pegasi E.	61 20 55	2614	59 48 54	2625	58 17 20	2657	56 46 13	2679
	SUN E.	81 13 51	2681	79 45 18	2666	78 17 4	2612	76 49 9	2626
3	Spica W.	102 46 11	2620	104 20 1	2641	105 53 36	2652	107 26 56	2666
	Antares W.	57 4 22	2626	58 38 18	2626	60 11 59	2646	61 45 25	2650
	Fomalhaut E.	34 52 46	4612	33 49 5	4671	32 47 41	4650	31 48 46	5061
	α Pegasi E.	49 17 39	2606	47 49 24	2621	46 21 40	2648	44 54 28	2676
	SUN E.	69 34 3	2606	68 7 52	2612	66 41 57	2626	65 16 18	2627
4	Antares W.	69 29 7	2610	71 1 13	2620	72 33 7	2626	74 4 49	2627
	α Pegasi E.	37 47 36	2647	36 24 19	2626	35 1 50	2426	33 40 13	2426
	SUN E.	58 11 36	2626	56 47 22	2607	55 23 19	2616	53 59 28	2626
5	Antares W.	81 40 46	2676	83 11 29	2683	84 42 3	2699	86 12 29	2696
	α Aquilæ W.	38 8 51	4626	39 8 6	4714	40 8 54	4612	41 11 8	4622
	SUN E.	47 3 7	2677	45 40 24	2696	44 17 51	2692	42 55 27	2402
6	Antares W.	93 42 50	2622	95 12 34	2626	96 42 12	2632	98 11 45	2636
	α Aquilæ W.	46 40 0	4126	47 48 40	4126	48 58 7	4090	50 8 18	4048
	SUN E.	36 5 55	2446	34 44 30	2464	33 23 14	2462	32 2 8	2472
7	α Aquilæ W.	56 8 22	2626	57 21 54	2664	58 35 50	2641	59 50 10	2619
	SUN E.	25 19 22	2626	23 59 27	2641	22 39 48	2656	21 20 26	2672
12	SUN W.	29 51 48	2462	31 12 48	2454	32 34 4	2444	33 55 31	2424
	Pollux E.	58 25 27	2671	56 56 42	2680	55 27 54	2666	53 59 2	2662
	Jupiter E.	84 17 25	2624	82 47 55	2620	81 18 19	2626	79 48 88	2620
	Regulus E.	95 12 43	2624	93 43 13	2620	92 13 38	2626	90 43 57	2620
	Saturn E.	100 14 49	2626	98 45 17	2620	97 15 40	2624	95 45 57	2618
13	SUN W.	40 45 25	2626	42 7 55	2679	43 30 35	2670	44 53 26	2660
	Pollux E.	46 33 42	2646	45 4 26	2643	43 35 6	2626	42 5 42	2627
	Jupiter E.	72 18 33	2626	70 48 12	2626	69 17 42	2620	67 47 4	2672
	Regulus E.	83 13 49	2626	81 43 26	2626	80 12 55	2678	78 42 15	2671
	Saturn E.	88 15 38	2626	86 45 12	2626	85 14 38	2677	83 43 56	2626
14	SUN W.	51 50 27	2611	53 14 26	2620	54 38 37	2626	56 3 1	2678
	Pollux E.	34 38 1	2626	33 8 24	2620	31 38 48	2620	30 9 13	2626
	Jupiter E.	60 11 40	2626	58 40 6	2627	57 8 21	2618	55 36 25	2610
	Regulus E.	71 6 35	2626	69 34 57	2626	68 3 7	2614	66 31 6	2605
	Saturn E.	76 8 8	2621	74 36 29	2626	73 4 39	2614	71 32 38	2606
15	SUN W.	62 8 23	2619	64 34 10	2626	66 0 13	2626	67 26 31	2676
	Aldebaran W.	22 21 50	2611	23 48 22	2626	25 15 52	2621	26 44 13	2626
	Pollux E.	22 43 4	2626	21 14 40	2614	19 46 47	2618	18 19 36	2618
	Jupiter E.	47 53 52	2626	46 20 44	2621	44 47 22	2641	43 13 47	2626

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of ME.	III ^h	P. L. of ME.	VI ^h	P. L. of ME.	IX ^h	P. L. of ME.
15	Regulus E.	64° 58' 54"	2898	63° 26' 30"	2888	61° 53' 53"	2878	60° 21' 3"	2866
	Saturn E.	70 0 25	2896	68 28 1	2887	66 55 25	2876	65 22 36	2866
16	SUN W.	68 53 6	3165	70 19 57	3151	71 47 5	3137	73 14 30	3128
	Aldebaran W.	28 13 21	3017	29 43 13	3085	31 13 45	3064	32 44 56	3025
	Mars W.	26 36 29	3043	28 5 49	3028	29 35 27	3014	31 5 23	2986
	Jupiter E.	41 39 57	2818	40 5 53	2808	38 31 35	2796	36 57 2	2786
	Regulus E.	52 33 29	2810	50 59 14	2798	49 24 44	2786	47 49 58	2773
	Saturn E.	57 35 13	2813	56 1 2	2801	54 26 36	2790	52 51 55	2779
	Spica E.	106 35 31	2801	105 1 4	2788	103 26 21	2775	101 51 21	2768
17	SUN W.	80 36 6	3046	82 5 22	3029	83 34 59	3013	85 4 56	2996
	Aldebaran W.	40 29 22	2803	42 3 47	2780	43 38 41	2769	45 14 3	2738
	Mars W.	38 39 48	2921	40 11 40	2905	41 43 53	2898	43 16 27	2871
	Jupiter E.	29 0 40	2731	27 24 41	2721	25 48 29	2711	24 12 4	2702
	Regulus E.	39 52 0	2710	38 15 34	2697	36 38 50	2684	35 1 48	2671
	Saturn E.	44 54 37	2719	43 18 22	2706	41 41 50	2694	40 5 2	2682
	Spica E.	93 51 53	2692	92 15 3	2678	90 37 53	2663	89 0 22	2647
18	SUN W.	92 40 1	2909	94 12 8	2891	95 44 38	2873	97 17 31	2846
	Aldebaran W.	53 17 41	2637	54 55 46	2618	56 34 17	2608	58 13 15	2578
	Mars W.	51 4 44	2768	52 39 30	2768	54 14 40	2760	55 50 14	2722
	Regulus E.	26 52 23	2610	25 13 42	2600	23 34 47	2591	21 55 39	2585
	Saturn E.	31 57 11	2629	30 18 55	2620	28 40 27	2612	27 1 49	2607
	Spica E.	80 47 32	2667	79 7 52	2551	77 27 49	2534	75 47 23	2517
19	SUN W.	105 7 51	2763	106 43 8	2744	108 18 49	2725	109 54 55	2707
	Aldebaran W.	66 34 43	2483	68 16 20	2465	69 58 23	2445	71 40 53	2427
	Mars W.	63 54 3	2640	65 32 3	2623	67 10 28	2604	68 49 18	2586
	Pollux W.	24 53 0	2601	26 31 53	2586	28 11 34	2573	29 52 1	2563
	Spica E.	67 19 20	2433	65 36 31	2415	63 53 17	2397	62 9 38	2380
	Antares E.	112 59 45	2428	111 16 47	2408	109 33 24	2391	107 49 36	2374
20	SUN W.	118 1 31	2617	119 40 3	2599	121 18 59	2582	122 58 19	2566
	Aldebaran W.	80 19 56	2336	82 5 3	2319	83 50 35	2302	85 36 32	2286
	Mars W.	77 9 47	2494	78 51 9	2476	80 32 56	2460	82 15 7	2441
	Pollux W.	38 24 29	2388	40 8 49	2346	41 53 42	2324	43 39 7	2308
	Spica E.	53 25 12	2298	51 39 5	2279	49 52 34	2263	48 5 39	2246
	Antares E.	99 4 23	2287	97 18 5	2270	95 31 21	2258	93 44 12	2237
21	Aldebaran W.	94 32 13	2207	96 20 30	2192	98 9 9	2179	99 58 8	2166
	Mars W.	90 52 7	2358	92 36 42	2344	94 21 38	2328	96 6 56	2314
	Pollux W.	52 33 31	2208	54 21 46	2192	56 10 26	2175	57 59 31	2169
	Jupiter W.	26 12 54	2208	28 1 13	2187	29 50 0	2169	31 39 14	2163
	Regulus W.	15 36 24	2274	17 23 1	2241	19 10 28	2210	20 58 40	2188
	Spica E.	39 5 21	2173	37 16 12	2159	35 26 43	2147	33 36 55	2134
22	Antares E.	84 42 32	2159	82 53 2	2144	81 3 10	2130	79 12 56	2116
	Mars W.	104 58 31	2249	106 45 46	2237	108 33 18	2227	110 21 5	2217
	Pollux W.	67 10 34	2090	69 1 48	2079	70 53 19	2068	72 45 7	2059
	Jupiter W.	40 51 23	2081	42 42 52	2068	44 34 40	2067	46 26 45	2047
	Regulus W.	30 8 22	2088	31 59 40	2078	33 51 20	2061	35 43 20	2049
	Saturn W.	25 41 1	2149	27 30 46	2126	29 21 5	2106	31 11 55	2088
	Antares E.	69 56 42	2064	68 4 32	2043	66 12 5	2033	64 19 22	2024

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DM.	XVh.	P. L. of DM.	XVIIIh.	P. L. of DM.	XXIh.	P. L. of DM.
15	Regulus E.	58° 48' 0"	2855	57° 14' 44"	2845	55° 41' 14"	2833	54° 7' 29"	2821
	Saturn E.	63 49 34	2856	62 16 19	2846	60 42 51	2834	59 9 9	2825
16	SUN W.	74 42 12	2108	76 10 12	2092	77 38 31	2077	79 7 9	2061
	Aldebaran W.	34 16 43	2898	35 49 5	2872	37 22 0	2848	38 55 26	2825
	Mars W.	32 35 38	2884	34 6 11	2868	35 37 4	2853	37 8 16	2837
	Jupiter E.	35 22 15	2774	33 47 13	2763	32 11 56	2752	30 36 25	2741
	Regulus E.	46 14 55	2761	44 39 36	2749	43 4 1	2736	41 28 9	2723
	Saturn E.	51 16 59	2767	49 41 48	2754	48 6 20	2742	46 30 36	2731
	Spica E.	100 16 4	2749	98 40 29	2735	97 4 36	2721	95 28 24	2707
17	SUN W.	86 35 14	2979	88 5 53	2962	89 36 54	2946	91 8 16	2927
	Aldebaran W.	46 49 52	2718	48 26 8	2697	50 2 52	2677	51 40 3	2657
	Mars W.	44 49 23	2655	46 22 40	2638	47 56 19	2621	49 30 20	2603
	Jupiter E.	22 35 27	2694	20 58 39	2688	19 21 43	2683	17 44 40	2678
	Regulus E.	33 24 29	2658	31 46 53	2645	30 8 59	2633	28 30 49	2621
	Saturn E.	38 27 58	2671	36 50 39	2659	35 13 4	2648	33 35 14	2638
	Spica E.	87 22 31	2632	85 44 19	2616	84 5 45	2600	82 26 50	2583
18	SUN W.	98 50 47	2837	100 24 27	2818	101 58 31	2800	103 32 59	2782
	Aldebaran W.	59 52 40	2659	61 32 31	2640	63 12 49	2621	64 53 33	2602
	Mars W.	57 26 11	2714	59 2 32	2696	60 39 18	2678	62 16 28	2659
	Regulus E.	20 16 23	2681	18 37 2	2661	16 57 41	2655	15 18 26	2638
	Saturn E.	25 23 4	2604	23 44 15	2605	22 5 27	2610	20 26 45	2618
	Spica E.	74 6 34	2500	72 25 21	2484	70 43 45	2467	69 1 45	2449
19	SUN W.	111 31 25	2689	113 8 20	2671	114 45 39	2652	116 23 23	2635
	Aldebaran W.	73 23 49	2409	75 7 11	2390	76 51 0	2372	78 35 15	2354
	Mars W.	70 28 33	2567	72 8 13	2548	73 48 19	2530	75 28 50	2512
	Pollux W.	31 33 11	2472	33 15 3	2445	34 57 34	2418	36 40 43	2392
	Spica E.	60 25 34	2383	58 41 6	2346	56 56 13	2328	55 10 55	2311
	Antares E.	106 5 24	2357	104 20 47	2339	102 35 44	2322	100 50 16	2304
20	SUN W.	124 38 2	2648	126 18 8	2623	127 58 36	2616	129 39 27	2600
	Aldebaran W.	87 22 53	2269	89 9 38	2253	90 56 47	2237	92 44 19	2223
	Mars W.	83 57 43	2424	85 40 43	2408	87 24 7	2391	89 7 55	2374
	Pollux W.	45 25 2	2283	47 11 27	2268	48 58 21	2246	50 45 42	2226
	Spica E.	46 18 20	2231	44 30 39	2216	42 42 35	2201	40 54 9	2186
	Antares E.	91 56 39	2221	90 8 43	2205	88 20 23	2189	86 31 39	2174
21	Aldebaran W.	101 47 27	2183	103 37 5	2141	105 27 2	2129	107 17 17	2118
	Mars W.	97 52 35	2300	99 38 34	2286	101 24 54	2273	103 11 33	2260
	Pollux W.	59 49 0	2144	61 38 52	2130	63 29 5	2116	65 19 39	2108
	Jupiter W.	33 28 53	2136	35 18 57	2121	37 9 24	2107	39 0 13	2098
	Regulus W.	22 47 33	2160	24 37 1	2139	26 27 0	2129	28 17 28	2108
	Spica E.	31 46 48	2123	29 56 24	2113	28 5 45	2108	26 14 51	2096
	Antares E.	77 22 21	2103	75 31 26	2089	73 40 10	2077	71 48 35	2065
22	Mars W.	112 9 7	2206	113 57 23	2200	115 45 51	2193	117 34 31	2184
	Pollux W.	74 37 11	2048	76 29 30	2040	78 22 2	2032	80 14 46	2026
	Jupiter W.	48 19 6	2037	50 11 42	2028	52 4 32	2020	53 57 35	2013
	Regulus W.	37 35 38	2086	39 28 13	2028	41 21 4	2019	43 14 9	2010
	Saturn W.	33 3 12	2073	34 54 53	2059	36 46 56	2046	38 39 18	2035
	Antares E.	62 26 25	2015	60 33 14	2007	58 39 51	2006	56 46 16	1993

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
23	Pollux W.	82° 7' 42"	2019	84° 0' 47"	2013	85° 54' 1"	2008	87° 47' 23"	2008
	Jupiter W.	55 50 49	2007	57 44 13	2001	59 37 46	1996	61 31 26	1992
	Regulus W.	45 7 28	2003	47 0 58	1996	48 54 38	1991	50 48 26	1987
	Saturn W.	40 31 57	2026	42 24 51	2017	44 17 58	2010	46 11 17	2004
	Antares E.	54 52 30	1987	52 58 35	1983	51 4 32	1977	49 10 22	1974
	α Aquilæ E.	107 19 27	2081	105 40 6	2066	104 0 23	2061	102 20 20	2056
24	Pollux W.	97 15 12	1996	99 8 49	2000	101 2 24	2001	102 55 56	2006
	Jupiter W.	71 0 58	1984	72 54 58	1986	74 48 56	1987	76 42 51	1989
	Regulus W.	60 18 47	1977	62 12 58	1977	64 7 9	1979	66 1 17	1981
	Saturn W.	55 39 43	1968	57 33 36	1963	59 27 29	1969	61 21 21	1961
	Antares E.	39 38 30	1966	37 44 5	1960	35 49 42	1971	33 55 22	1974
	α Aquilæ E.	93 56 48	2007	92 15 45	2007	90 34 42	2000	88 53 40	2013
25	Jupiter W.	86 11 5	2014	88 4 18	2021	89 57 19	2020	91 50 8	2026
	Regulus W.	75 30 40	2004	77 24 8	2011	79 17 25	2019	81 10 30	2026
	Saturn W.	70 49 33	2013	72 42 49	2019	74 35 54	2026	76 28 47	2026
	Spica W.	21 31 16	2028	23 23 59	2026	25 16 38	2020	27 9 11	2044
	α Aquilæ E.	80 30 31	2066	78 50 35	2070	77 10 59	2060	75 31 45	2064
	Fomalhaut E.	105 32 59	2441	103 50 22	2440	102 7 47	2443	100 25 14	2446
26	Jupiter W.	101 10 25	2002	103 1 36	2108	104 52 27	2116	106 42 58	2129
	Regulus W.	90 32 12	2061	92 23 41	2068	94 14 51	2107	96 5 40	2120
	Saturn W.	85 49 35	2066	87 40 53	2100	89 31 52	2113	91 22 31	2126
	Spica W.	36 29 21	2097	38 20 40	2098	40 11 42	2111	42 2 25	2122
	α Aquilæ E.	67 22 50	2780	65 46 50	2768	64 11 33	2797	62 37 1	2834
	Fomalhaut E.	91 54 25	2469	90 12 55	2506	88 31 42	2614	86 50 48	2620
27	α Pegasi E.	113 2 40	2244	111 15 18	2203	109 28 8	2261	107 41 11	2270
	Saturn W.	100 30 15	2204	102 18 36	2220	104 6 33	2238	105 54 4	2260
	Spica W.	51 10 52	2196	52 59 26	2212	54 47 36	2220	56 35 21	2246
	α Aquilæ E.	54 57 41	2071	53 28 56	2120	52 1 28	2108	50 35 6	2203
	Fomalhaut E.	78 32 12	2626	76 53 52	2649	75 16 3	2673	73 38 46	2696
	α Pegasi E.	98 50 37	2236	97 5 30	2261	95 20 45	2267	93 36 23	2284
28	SUN E.	143 56 52	2630	142 16 20	2646	140 36 9	2661	138 56 20	2676
	Spica W.	65 27 44	2234	67 12 54	2223	68 57 38	2271	70 41 55	2298
	Antares W.	19 46 6	2237	21 31 11	2244	23 15 51	2273	25 0 5	2290
	α Aquilæ E.	43 46 2	2709	42 29 25	2626	41 14 49	2662	40 2 22	2693
	Fomalhaut E.	65 41 29	2648	64 8 3	2683	62 35 21	2618	61 3 25	2665
	α Pegasi E.	85 0 46	2475	83 18 57	2484	81 37 36	2615	79 56 43	2626
29	SUN E.	130 42 56	2664	129 5 28	2664	127 28 26	2702	125 51 49	2721
	Spica W.	79 16 33	2465	80 58 8	2608	82 39 17	2623	84 20 0	2640
	Antares W.	33 34 49	2462	35 16 27	2601	36 57 39	2620	38 38 25	2626
	Fomalhaut E.	53 36 21	2177	52 9 44	2229	50 44 9	2263	49 19 38	2243
	α Pegasi E.	71 39 32	2643	70 1 34	2606	68 24 7	2607	66 47 10	2711
	SUN E.	117 55 9	2620	116 21 7	2630	114 47 30	2660	113 14 19	2690
30	Spica W.	92 37 13	2682	94 15 25	2649	95 53 14	2660	97 30 39	2684
	Antares W.	46 55 56	2629	48 34 12	2646	50 12 5	2663	51 49 34	2681
	Fomalhaut E.	42 35 21	2706	41 18 40	2706	40 3 34	2690	38 56 9	2694
	α Pegasi E.	58 50 18	2681	57 16 31	2607	55 43 17	2683	54 10 36	2610
	SUN E.	105 34 42	2677	104 4 0	2606	102 33 41	2614	101 3 45	2622

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXth.	P. L. of Dist.
23	Pollux W.	89° 40' 50"	2001	91° 34' 22"	2000	93° 27' 57"	1998	95° 21' 34"	1996
	Jupiter W.	63 25 13	1999	65 19 4	1996	67 13 0	1995	69 6 58	1984
	Regulus W.	52 42 21	1983	54 36 22	1981	56 30 27	1978	58 24 36	1977
	Saturn W.	48 4 45	1999	49 58 21	1994	51 52 4	1991	53 45 52	1989
	Antares E.	47 16 6	1971	45 21 46	1968	43 27 22	1967	41 32 56	1967
	α Aquilæ E.	100 40 0	2528	98 59 26	2590	97 18 41	2514	95 37 47	2510
24	Pollux W.	104 49 23	2009	106 42 44	2014	108 35 57	2019	110 29 1	2026
	Jupiter W.	78 36 43	1993	80 30 30	1996	82 24 10	2001	84 17 42	2007
	Regulus W.	67 55 22	1984	69 49 22	1987	71 43 16	1993	73 37 2	1996
	Saturn W.	63 15 10	1993	65 8 55	1996	67 2 35	2001	68 56 8	2006
	Antares E.	32 1 7	1978	30 6 58	1982	28 12 56	1998	26 19 3	1995
	α Aquilæ E.	87 12 43	2517	85 31 53	2524	83 51 13	2533	82 10 45	2543
25	Jupiter W.	93 42 43	2048	95 35 3	2066	97 27 7	2068	99 18 55	2080
	Regulus W.	83 3 21	2037	84 55 58	2046	86 48 20	2067	88 40 25	2069
	Saturn W.	78 21 27	2044	80 13 53	2068	82 6 4	2064	83 57 58	2075
	Spica W.	29 1 36	2051	30 53 51	2066	32 45 55	2066	34 37 46	2077
	α Aquilæ E.	73 52 56	2626	72 14 35	2648	70 36 45	2678	68 59 29	2701
	Fomalhaut E.	96 42 45	2451	97 0 23	2466	95 18 11	2487	93 36 11	2477
26	Jupiter W.	108 33 7	2147	110 22 54	2168	112 12 18	2178	114 1 18	2194
	Regulus W.	97 56 8	2126	99 46 14	2149	101 35 58	2166	103 25 19	2181
	Saturn W.	93 12 48	2141	95 2 44	2156	96 52 18	2171	98 41 29	2188
	Spica W.	43 52 49	2126	45 42 53	2151	47 32 35	2166	49 21 55	2180
	α Aquilæ E.	61 3 17	2674	59 30 25	2619	57 58 30	2666	56 27 34	2616
	Fomalhaut E.	85 10 16	2646	83 30 7	2664	81 50 22	2683	80 11 3	2693
27	α Pegasi E.	105 54 28	2283	104 8 2	2294	102 21 54	2307	100 36 5	2323
	Saturn W.	107 41 8	2274	109 27 46	2293	111 13 57	2311	112 59 41	2331
	Spica W.	58 22 41	2263	60 9 36	2280	61 56 5	2296	63 42 8	2316
	α Aquilæ E.	49 10 11	2338	47 46 43	2419	46 24 48	2507	45 4 32	2604
	Fomalhaut E.	72 2 3	2726	70 25 56	2763	68 50 27	2784	67 15 38	2816
	α Pegasi E.	91 52 25	2401	90 8 52	2419	88 25 44	2437	86 43 2	2456
28	SUN E.	137 16 52	2693	135 37 47	2610	133 59 6	2628	132 20 49	2646
	Spica W.	72 25 45	2408	74 9 8	2428	75 52 3	2447	77 34 31	2466
	Antares W.	26 43 54	2408	28 27 17	2436	30 10 14	2445	31 52 45	2464
	α Aquilæ E.	38 52 14	4349	37 44 34	4422	36 39 33	4615	35 37 21	4631
	Fomalhaut E.	59 32 16	2696	58 1 57	2687	56 32 30	2661	55 3 57	2638
	α Pegasi E.	78 16 19	2656	76 36 23	2677	74 56 57	2699	73 18 0	2690
29	SUN E.	124 15 37	2741	122 39 51	2760	121 4 31	2780	119 29 37	2800
	Spica W.	86 0 17	2659	87 40 9	2677	89 19 35	2696	90 58 36	2613
	Antares W.	40 18 46	2666	41 58 41	2674	43 38 11	2693	45 17 16	2611
	Fomalhaut E.	47 56 15	2405	46 34 4	2471	45 13 8	2544	43 53 32	2622
	α Pegasi E.	65 10 45	2736	63 34 51	2768	61 59 28	2783	60 24 37	2807
	SUN E.	111 41 34	2699	110 9 14	2619	108 37 19	2638	107 5 48	2636
30	Spica W.	99 7 41	2701	100 44 20	2718	102 20 36	2736	103 56 29	2762
	Antares W.	53 26 39	2696	55 3 21	2715	56 39 41	2731	58 15 40	2747
	Fomalhaut E.	37 38 33	4124	36 28 54	4265	35 21 20	4401	34 16 0	4564
	α Pegasi E.	52 38 30	2637	51 6 58	2665	49 36 1	2693	48 5 40	2623
	SUN E.	99 34 12	2669	98 5 1	2669	96 36 13	2687	95 7 47	2608

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.											
Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.				Semi-diameter.
		^h ^m ^s	^s		[°] ['] ["]	["] ['] ^s					
Wed.	1	2 34 30.39	9.544	N.15 9 24.7	45.21	15 54.08	66.07	3 4.50	0.313		
Thur.	2	2 38 19.70	9.567	15 27 22.3	44.58	15 53.84	66.15	3 11.73	0.289		
Fri.	3	2 42 9.58	9.591	15 45 4.7	43.94	15 53.60	66.23	3 18.38	0.265		
Sat.	4	2 46 0.03	9.615	16 2 31.5	43.29	15 53.36	66.31	3 24.47	0.241		
Sun.	5	2 49 51.06	9.639	16 19 42.5	42.62	15 53.12	66.39	3 29.99	0.217		
Mon.	6	2 53 42.66	9.663	16 36 37.4	41.94	15 52.89	66.47	3 34.92	0.193		
Tues.	7	2 57 34.85	9.687	16 53 15.8	41.25	15 52.67	66.55	3 39.28	0.169		
Wed.	8	3 1 27.62	9.711	17 9 37.4	40.54	15 52.45	66.63	3 43.06	0.145		
Thur.	9	3 5 20.96	9.735	17 25 41.8	39.82	15 52.23	66.71	3 46.26	0.121		
Fri.	10	3 9 14.88	9.759	17 41 28.7	39.08	15 52.02	66.80	3 48.88	0.097		
Sat.	11	3 13 9.37	9.783	17 56 57.7	38.33	15 51.82	66.89	3 50.94	0.073		
Sun.	12	3 17 4.43	9.807	18 12 8.7	37.58	15 51.62	66.97	3 52.43	0.050		
Mon.	13	3 21 0.08	9.831	18 27 1.4	36.81	15 51.42	67.05	3 53.33	0.027		
Tues.	14	3 24 56.29	9.853	18 41 35.5	36.02	15 51.22	67.13	3 53.68	0.004		
Wed.	15	3 28 53.05	9.876	18 55 50.7	35.23	15 51.03	67.21	3 53.48	0.020		
Thur.	16	3 32 50.35	9.899	19 9 46.6	34.42	15 50.84	67.29	3 52.74	0.043		
Fri.	17	3 36 48.20	9.922	19 23 23.0	33.60	15 50.66	67.37	3 51.45	0.066		
Sat.	18	3 40 46.60	9.944	19 36 39.6	32.78	15 50.48	67.45	3 49.60	0.088		
Sun.	19	3 44 45.55	9.967	19 49 36.4	31.94	15 50.30	67.53	3 47.22	0.110		
Mon.	20	3 48 45.03	9.989	20 2 13.0	31.09	15 50.12	67.61	3 44.32	0.132		
Tues.	21	3 52 45.03	10.011	20 14 28.9	30.23	15 49.95	67.69	3 40.88	0.154		
Wed.	22	3 56 45.56	10.032	20 26 24.2	29.36	15 49.78	67.77	3 36.91	0.176		
Thur.	23	4 0 46.60	10.053	20 37 58.6	28.49	15 49.61	67.84	3 32.44	0.198		
Fri.	24	4 4 48.15	10.075	20 49 11.8	27.60	15 49.24	67.91	3 27.46	0.219		
Sat.	25	4 8 50.22	10.096	21 0 3.7	26.71	15 49.28	67.98	3 21.96	0.239		
Sun.	26	4 12 52.79	10.117	21 10 33.9	25.80	15 49.12	68.05	3 15.97	0.260		
Mon.	27	4 16 55.86	10.137	21 20 42.2	24.88	15 48.96	68.12	3 9.48	0.281		
Tues.	28	4 20 59.42	10.157	21 30 28.5	23.96	15 48.81	68.18	3 2.49	0.301		
Wed.	29	4 25 3.46	10.176	21 39 52.6	23.03	15 48.66	68.24	2 55.03	0.321		
Thur.	30	4 29 7.96	10.195	21 48 54.3	22.09	15 48.51	68.30	2 47.12	0.339		
Fri.	31	4 33 12.90	10.214	21 57 33.3	21.14	15 48.37	68.36	2 38.76	0.357		
Sat.	32	4 37 18.27	10.232	N.22 5 49.3	20.18	15 48.23	68.42	2 29.97	0.375		

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	[°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Wed.	1	2 34 30.88	9.544	N.15° 9' 27.1	45.21	3 4.51	0.313	2 37 35.39
Thur.	2	2 38 20.21	9.567	15 27 24.8	44.58	3 11.74	0.289	2 41 31.95
Fri.	3	2 42 10.11	9.591	15 45 7.2	43.94	3 18.39	0.265	2 45 28.50
Sat.	4	2 46 0.58	9.615	16 2 34.0	43.29	3 24.48	0.241	2 49 25.06
Sun.	5	2 49 51.62	9.639	16 19 45.0	42.62	3 30.00	0.217	2 53 21.62
Mon.	6	2 53 43.24	9.663	16 36 39.9	41.94	3 34.93	0.193	2 57 18.17
Tues.	7	2 57 35.44	9.687	16 53 18.3	41.25	3 39.29	0.169	3 1 14.73
Wed.	8	3 1 28.22	9.711	17 9 39.9	40.54	3 43.06	0.145	3 5 11.28
Thur.	9	3 5 21.57	9.735	17 25 44.3	39.82	3 46.27	0.121	3 9 7.84
Fri.	10	3 9 15.50	9.759	17 41 31.2	39.08	3 48.89	0.097	3 13 4.39
Sat.	11	3 13 10.00	9.783	17 57 0.2	38.33	3 50.95	0.073	3 17 0.95
Sun.	12	3 17 5.07	9.807	18 12 11.2	37.58	3 52.44	0.050	3 20 57.51
Mon.	13	3 21 0.72	9.831	18 27 3.9	36.81	3 53.34	0.027	3 24 54.06
Tues.	14	3 24 56.93	9.853	18 41 37.9	36.02	3 53.68	0.004	3 28 50.61
Wed.	15	3 28 53.69	9.876	18 55 53.0	35.23	3 53.48	0.020	3 32 47.17
Thur.	16	3 32 50.99	9.899	19 9 48.9	34.42	3 52.74	0.043	3 36 43.73
Fri.	17	3 36 48.84	9.922	19 23 25.2	33.60	3 51.45	0.066	3 40 40.29
Sat.	18	3 40 47.24	9.944	19 36 41.7	32.78	3 49.60	0.088	3 44 36.84
Sun.	19	3 44 46.18	9.967	19 49 38.4	31.94	3 47.22	0.110	3 48 33.40
Mon.	20	3 48 45.65	9.989	20 2 14.9	31.09	3 44.31	0.132	3 52 29.96
Tues.	21	3 52 45.65	10.011	20 14 30.8	30.23	3 40.87	0.154	3 56 26.52
Wed.	22	3 56 46.17	10.032	20 26 26.0	29.36	3 36.90	0.176	4 0 23.07
Thur.	23	4 0 47.20	10.053	20 38 0.3	28.49	3 32.43	0.198	4 4 19.63
Fri.	24	4 4 48.74	10.075	20 49 13.4	27.60	3 27.45	0.219	4 8 16.19
Sat.	25	4 8 50.79	10.096	21 0 5.2	26.71	3 21.95	0.239	4 12 12.74
Sun.	26	4 12 53.34	10.117	21 10 35.3	25.80	3 15.96	0.260	4 16 9.30
Mon.	27	4 16 56.39	10.137	21 20 43.5	24.88	3 9.47	0.281	4 20 5.86
Tues.	28	4 20 59.93	10.157	21 30 29.7	23.96	3 2.48	0.301	4 24 2.41
Wed.	29	4 25 3.95	10.176	21 39 53.7	23.03	2 55.02	0.321	4 27 58.97
Thur.	30	4 29 8.43	10.195	21 48 55.3	22.09	2 47.10	0.339	4 31 55.53
Fri.	31	4 33 13.35	10.214	21 57 34.2	21.14	2 38.74	0.357	4 35 52.09
Sat.	32	4 37 18.70	10.232	N.22° 5' 50.1	20.18	2 29.95	0.375	4 39 48.65

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S									
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.			
		λ	λ'								
		$^{\circ}$	$'$	$''$	$^{\circ}$						$'$
1	121	41	3	53.4	3	21.6	145.39	+0.26	0.0035987	45.7	21 18 54.51
2	122	42	2	1.9	1	30.0	145.33	0.40	.0087080	45.2	21 14 58.60
3	123	42	60	9.0	59	37.0	145.27	0.51	.0088161	44.7	21 11 2.69
4	124	43	58	14.7	57	42.5	145.21	0.60	.0089230	44.2	21 7 6.78
5	125	44	56	19.1	55	46.7	145.15	0.67	.0040285	43.6	21 3 10.87
6	126	45	54	22.0	53	49.5	145.09	0.72	.0041323	42.9	20 59 14.96
7	127	46	52	23.4	51	50.8	145.03	0.73	.0042345	42.1	20 55 19.05
8	128	47	50	23.3	49	50.6	144.97	0.71	.0043348	41.3	20 51 23.14
9	129	48	48	21.7	47	48.8	144.91	0.65	.0044332	40.5	20 47 27.24
10	130	49	46	18.6	45	45.5	144.84	0.57	.0045297	39.7	20 43 31.33
11	131	50	44	13.9	43	40.7	144.77	0.48	.0046242	39.0	20 39 35.42
12	132	51	42	7.6	41	34.3	144.70	0.38	.0047169	38.2	20 35 39.51
13	133	52	39	59.7	39	26.2	144.63	0.26	.0048076	37.4	20 31 43.60
14	134	53	37	50.1	37	16.4	144.56	+0.13	.0048964	36.7	20 27 47.69
15	135	54	35	38.8	35	4.9	144.49	0.00	.0049836	36.0	20 23 51.78
16	136	55	33	25.8	32	51.8	144.42	-0.11	.0050691	35.2	20 19 55.87
17	137	56	31	11.1	30	37.0	144.35	0.20	.0051529	34.6	20 15 59.96
18	138	57	28	54.7	28	20.4	144.38	0.29	.0052352	34.1	20 12 4.05
19	139	58	26	36.6	26	2.1	144.31	0.35	.0053162	33.5	20 8 8.13
20	140	59	24	17.0	23	42.3	144.15	0.36	.0053960	33.0	20 4 12.22
21	141	60	21	56.0	21	21.2	144.09	0.34	.0054748	32.6	20 0 16.31
22	142	61	19	33.6	18	58.7	144.03	0.30	.0055525	32.2	19 56 20.40
23	143	62	17	9.8	16	34.7	143.98	0.23	.0056290	31.7	19 52 24.49
24	144	63	14	44.7	14	9.4	143.93	0.14	.0057044	31.2	19 48 28.57
25	145	64	12	18.4	11	42.9	143.88	-0.03	.0057788	30.7	19 44 32.66
26	146	65	9	51.0	9	15.4	143.84	+0.10	.0058520	30.2	19 40 36.75
27	147	66	7	22.6	6	46.8	143.80	0.24	.0059241	29.7	19 36 40.84
28	148	67	4	53.3	4	17.3	143.76	0.38	.0059949	29.2	19 32 44.93
29	149	68	2	23.2	1	47.0	143.72	0.52	.0060644	28.7	19 28 49.01
30	150	68	59	52.2	59	15.8	143.69	0.64	.0061326	28.1	19 24 53.10
31	151	69	57	20.4	56	43.9	143.67	0.73	.0061991	27.3	19 20 57.19
32	152	70	54	47.9	54	11.2	143.64	+0.79	0.0062637	26.5	19 17 1.28

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	15' 21.6	15' 15.2	56' 15.8	-2.03	55' 52.3	-1.87	18 ^h 34.4 ^m	1.88	21.2 ^d
2	15 9.4	15 4.2	55 30.9	1.60	55 11.8	1.50	19 17.9	1.76	22.2
3	14 59.6	14 55.6	54 54.8	1.32	54 40.2	1.13	19 59.3	1.70	23.2
4	14 52.2	14 49.5	54 27.8	0.94	54 17.6	0.75	20 39.6	1.67	24.2
5	14 47.3	14 45.7	54 9.7	0.58	54 3.8	0.40	21 19.8	1.69	25.2
6	14 44.6	14 44.1	53 59.9	-0.24	53 58.0	-0.08	22 1.0	1.75	26.2
7	14 44.1	14 44.5	53 57.8	+0.05	53 59.1	+0.17	22 48.9	1.84	27.2
8	14 45.2	14 46.3	54 1.9	0.20	54 6.1	0.41	23 29.2	1.94	28.2
9	14 47.8	14 49.6	54 11.7	0.51	54 18.4	0.61	δ		29.2
10	14 51.8	14 54.3	54 26.4	0.71	54 35.4	0.80	0 17.0	2.04	0.5
11	14 57.1	15 0.1	54 45.5	0.89	54 56.8	0.98	1 7.2	2.13	1.5
12	15 3.5	15 7.1	55 9.1	1.07	55 22.5	1.16	1 59.1	2.19	2.5
13	15 11.1	15 15.3	55 37.0	1.25	55 52.6	1.35	2 51.9	2.20	3.5
14	15 19.9	15 24.7	56 9.3	1.44	56 27.1	1.52	3 44.2	2.15	4.5
15	15 29.8	15 35.2	56 45.9	1.61	57 5.6	1.69	4 35.3	2.10	5.5
16	15 40.8	15 46.6	57 26.3	1.75	57 47.6	1.81	5 25.0	2.05	6.5
17	15 52.6	15 58.6	58 9.5	1.84	58 31.7	1.85	6 13.8	2.02	7.5
18	16 4.6	16 10.5	58 53.7	1.83	59 15.3	1.77	7 2.3	2.03	8.5
19	16 16.1	16 21.4	59 35.9	1.67	59 55.2	1.53	7 51.6	2.09	9.5
20	16 26.1	16 30.1	60 12.4	1.34	60 27.1	1.11	8 43.0	2.20	10.5
21	16 33.3	16 35.5	60 38.8	0.83	60 46.9	+0.52	9 37.5	2.35	11.5
22	16 36.6	16 36.6	60 51.2	+0.18	60 51.3	-0.17	10 35.7	2.50	12.5
23	16 35.5	16 33.2	60 47.1	-0.53	60 38.7	0.88	11 37.3	2.62	13.5
24	16 29.8	16 25.4	60 26.2	1.20	60 10.0	1.51	12 40.8	2.64	14.5
25	16 20.1	16 13.9	59 50.3	1.76	59 27.9	1.98	13 43.4	2.55	15.5
26	16 7.2	16 0.0	59 3.2	2.14	58 36.8	2.25	14 42.6	2.38	16.5
27	15 52.6	15 45.1	58 9.5	2.29	57 42.0	2.29	15 37.4	2.18	17.5
28	15 37.7	15 30.5	57 14.8	2.25	56 48.2	2.17	16 27.3	1.99	18.5
29	15 23.6	15 17.1	56 22.8	2.06	55 59.0	1.91	17 13.2	1.84	19.5
30	15 11.1	15 5.7	55 37.0	1.74	55 17.2	1.56	17 56.1	1.75	20.5
31	15 0.9	14 56.8	54 59.6	1.37	54 44.4	1.16	18 37.2	1.70	21.5
32	14 53.3	14 50.5	54 31.7	-0.95	54 21.5	-0.74	19 17.7	1.69	22.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	^h 20 ^m 37 ^s 14.18	2.0386	S. 16° 37' 59.7"	10.441	0	^h 22 ^m 11 ^s 22.82	1.8093	S. 7° 16' 25.0"	12.487
1	20 39 19.37	2.0383	16 27 25.3	10.606	1	22 13 14.28	1.8061	7 3 55.2	12.606
2	20 41 24.18	2.0770	16 16 47.0	10.670	2	22 15 5.56	1.8030	6 51 24.4	12.622
3	20 43 28.62	2.0766	16 6 4.9	10.723	3	22 16 56.66	1.8002	6 38 52.5	12.639
4	20 45 32.69	2.0647	15 55 19.1	10.784	4	22 18 47.59	1.8473	6 26 19.7	12.655
5	20 47 36.39	2.0665	15 44 29.6	10.864	5	22 20 38.35	1.8440	6 13 45.9	12.672
6	20 49 39.72	2.0685	15 33 36.6	10.913	6	22 22 28.94	1.8419	6 1 11.1	12.687
7	20 51 42.69	2.0466	15 22 40.0	10.972	7	22 24 19.37	1.8391	5 48 35.5	12.691
8	20 53 45.30	2.0465	15 11 40.0	11.028	8	22 26 9.64	1.8365	5 35 59.0	12.614
9	20 55 47.56	2.0347	15 0 36.6	11.083	9	22 27 59.76	1.8341	5 23 21.8	12.697
10	20 57 49.47	2.0280	14 49 30.0	11.137	10	22 29 49.74	1.8317	5 10 43.8	12.638
11	20 59 51.04	2.0233	14 38 20.1	11.192	11	22 31 39.57	1.8292	4 58 5.2	12.649
12	21 1 52.26	2.0175	14 27 7.0	11.244	12	22 33 29.26	1.8270	4 45 25.9	12.660
13	21 3 53.14	2.0119	14 15 50.8	11.295	13	22 35 18.82	1.8249	4 32 46.0	12.669
14	21 5 53.69	2.0064	14 4 31.6	11.345	14	22 37 8.25	1.8227	4 20 5.6	12.678
15	21 7 53.91	2.0009	13 53 9.4	11.395	15	22 38 57.55	1.8206	4 7 24.6	12.687
16	21 9 53.80	1.9955	13 41 44.2	11.443	16	22 40 46.73	1.8187	3 54 43.2	12.694
17	21 11 53.37	1.9901	13 30 16.2	11.490	17	22 42 35.80	1.8168	3 42 1.3	12.701
18	21 13 52.62	1.9849	13 18 45.4	11.537	18	22 44 24.75	1.8149	3 29 19.1	12.707
19	21 15 51.56	1.9797	13 7 11.8	11.582	19	22 46 13.59	1.8131	3 16 36.5	12.713
20	21 17 50.19	1.9745	12 55 35.6	11.626	20	22 48 2.33	1.8115	3 3 53.6	12.718
21	21 19 48.51	1.9696	12 43 56.8	11.668	21	22 49 50.97	1.8098	2 51 10.4	12.723
22	21 21 46.53	1.9645	12 32 15.4	11.711	22	22 51 39.51	1.8082	2 38 27.0	12.726
23	21 23 44.25	1.9595	S. 12° 20' 31.5"	11.752	23	22 53 27.96	1.8068	S. 2° 25' 43.4"	12.728
THURSDAY 2.					SATURDAY 4.				
0	21 25 41.67	1.9546	S. 12° 8' 45.1"	11.792	0	22 55 16.33	1.8054	S. 2° 12' 59.6"	12.731
1	21 27 38.81	1.9499	11 56 56.4	11.831	1	22 57 4.61	1.8040	2 0 15.7	12.733
2	21 29 35.66	1.9451	11 45 5.4	11.861	2	22 58 52.82	1.8028	1 47 31.8	12.733
3	21 31 32.23	1.9405	11 33 12.1	11.897	3	23 0 40.95	1.8016	1 34 47.9	12.733
4	21 33 28.53	1.9360	11 21 16.6	11.943	4	23 2 29.01	1.8004	1 22 3.9	12.731
5	21 35 24.55	1.9314	11 9 18.9	11.978	5	23 4 17.00	1.7993	1 9 20.1	12.730
6	21 37 20.30	1.9270	10 57 19.2	12.012	6	23 6 4.93	1.7983	0 56 36.3	12.728
7	21 39 15.79	1.9226	10 45 17.4	12.047	7	23 7 52.80	1.7974	0 43 52.7	12.726
8	21 41 11.02	1.9184	10 33 13.6	12.079	8	23 9 40.62	1.7966	0 31 9.2	12.723
9	21 43 6.00	1.9141	10 21 7.9	12.111	9	23 11 28.38	1.7956	0 18 26.0	12.717
10	21 45 0.72	1.9100	10 9 0.3	12.142	10	23 13 16.10	1.7949	S. 0° 5' 43.1"	12.713
11	21 46 55.20	1.9060	9 56 50.9	12.172	11	23 15 3.77	1.7943	N. 0° 6' 59.6"	12.708
12	21 48 49.43	1.9018	9 44 39.7	12.201	12	23 16 51.41	1.7936	0 19 41.9	12.703
13	21 50 43.42	1.8979	9 32 26.8	12.229	13	23 18 39.01	1.7930	0 32 23.9	12.697
14	21 52 37.18	1.8940	9 20 12.2	12.257	14	23 20 26.58	1.7925	0 45 5.5	12.690
15	21 54 30.70	1.8902	9 7 55.9	12.284	15	23 22 14.12	1.7920	0 57 46.6	12.681
16	21 56 24.01	1.8864	8 55 38.1	12.308	16	23 24 1.63	1.7916	1 10 27.2	12.672
17	21 58 17.09	1.8829	8 43 18.8	12.331	17	23 25 49.12	1.7914	1 23 07.3	12.663
18	22 0 9.96	1.8798	8 30 58.0	12.359	18	23 27 36.60	1.7911	1 35 46.8	12.654
19	22 2 2.61	1.8757	8 18 35.7	12.382	19	23 29 24.06	1.7910	1 48 25.8	12.643
20	22 3 55.05	1.8733	8 6 12.1	12.404	20	23 31 11.52	1.7908	2 1 4.0	12.633
21	22 5 47.29	1.8690	7 53 47.2	12.426	21	23 32 58.97	1.7908	2 13 41.6	12.620
22	22 7 39.33	1.8656	7 41 21.0	12.447	22	23 34 46.42	1.7908	2 26 18.4	12.607
23	22 9 31.17	1.8623	7 28 53.6	12.467	23	23 36 33.87	1.7908	2 38 54.5	12.595
24	22 11 22.82	1.8592	S. 7° 16' 25.0"	12.487	24	23 38 21.33	1.7910	N. 2° 51' 29.8"	12.581

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 5.					TUESDAY 7.				
0.	23 38 21.33	1.7910	N. 2° 51' 29.8"	12.561	0	1 5 38.13	1.9874	N. 12° 26' 55.4"	11.130
1	23 40 8.79	1.7911	3 4 4.2	12.566	1	1 7 30.26	1.9783	12 38 1.8	11.583
2	23 41 56.27	1.7914	3 16 37.7	12.561	2	1 9 22.57	1.9783	12 49 5.3	11.634
3	23 43 43.76	1.7917	3 29 10.3	12.556	3	1 11 15.05	1.9761	13 0 5.9	10.985
4	23 45 31.28	1.7921	3 41 42.0	12.549	4	1 13 7.71	1.9791	13 11 3.5	10.935
5	23 47 18.82	1.7924	3 54 12.6	12.502	5	1 15 0.55	1.9822	13 21 58.1	10.884
6	23 49 6.39	1.7930	4 6 42.2	12.484	6	1 16 53.58	1.9833	13 32 49.6	10.833
7	23 50 53.99	1.7936	4 19 10.7	12.467	7	1 18 46.79	1.9863	13 43 38.0	10.780
8	23 52 41.63	1.7943	4 31 38.2	12.448	8	1 20 40.20	1.9917	13 54 23.2	10.727
9	23 54 29.31	1.7950	4 44 4.5	12.428	9	1 22 33.80	1.9949	14 5 5.2	10.673
10	23 56 17.03	1.7956	4 56 29.6	12.406	10	1 24 27.59	1.9981	14 15 44.0	10.619
11	23 58 4.79	1.7965	5 8 53.5	12.387	11	1 26 21.58	1.9915	14 26 19.5	10.564
12	23 59 52.61	1.7974	5 21 16.1	12.366	12	1 28 15.77	1.9948	14 36 51.7	10.508
13	0 1 40.48	1.7984	5 33 37.4	12.343	13	1 30 10.16	1.9982	14 47 20.5	10.451
14	0 3 28.42	1.7995	5 45 57.3	12.320	14	1 32 4.76	1.9116	14 57 45.8	10.393
15	0 5 16.42	1.8005	5 58 15.8	12.297	15	1 33 59.56	1.9149	15 8 7.7	10.336
16	0 7 4.48	1.8015	6 10 32.9	12.272	16	1 35 54.57	1.9183	15 18 26.0	10.275
17	0 8 52.61	1.8026	6 22 48.5	12.247	17	1 37 49.79	1.9220	15 28 40.7	10.215
18	0 10 40.82	1.8040	6 35 2.6	12.222	18	1 39 45.22	1.9256	15 38 51.8	10.154
19	0 12 29.10	1.8052	6 47 15.1	12.196	19	1 41 40.87	1.9292	15 48 59.2	10.092
20	0 14 17.46	1.8066	6 59 26.0	12.168	20	1 43 36.73	1.9328	15 59 2.9	10.030
21	0 16 5.91	1.8081	7 11 35.3	12.141	21	1 45 32.81	1.9365	16 9 2.8	9.967
22	0 17 54.44	1.8096	7 23 42.9	12.112	22	1 47 29.11	1.9402	16 18 58.9	9.902
23	0 19 43.07	1.8113	N. 7° 35' 48.8"	12.084	23	1 49 25.64	1.9440	N. 16° 28' 51.1"	9.837
MONDAY 6.					WEDNESDAY 8.				
0	0 21 31.80	1.8129	N. 7° 47' 53.0"	12.055	0	1 51 22.39	1.9477	N. 16° 38' 39.3"	9.771
1	0 23 20.62	1.8145	7 59 55.4	12.026	1	1 53 19.37	1.9515	16 48 23.6	9.706
2	0 25 9.55	1.8163	8 11 55.9	11.992	2	1 55 16.57	1.9553	16 58 3.9	9.637
3	0 26 58.58	1.8180	8 23 54.5	11.961	3	1 57 14.01	1.9591	17 7 40.1	9.568
4	0 28 47.71	1.8199	8 35 51.2	11.928	4	1 59 11.67	1.9630	17 17 12.1	9.499
5	0 30 36.96	1.8218	8 47 45.9	11.895	5	2 1 9.57	1.9669	17 26 40.0	9.430
6	0 32 26.33	1.8238	8 59 38.6	11.861	6	2 3 7.70	1.9707	17 36 3.7	9.360
7	0 34 15.82	1.8258	9 11 29.2	11.827	7	2 5 6.06	1.9746	17 45 23.1	9.287
8	0 36 5.43	1.8279	9 23 17.8	11.793	8	2 7 4.66	1.9785	17 54 38.2	9.215
9	0 37 55.17	1.8300	9 35 4.4	11.757	9	2 9 3.50	1.9825	18 3 48.9	9.141
10	0 39 45.03	1.8320	9 46 48.7	11.719	10	2 11 2.58	1.9866	18 12 55.1	9.067
11	0 41 35.02	1.8343	9 58 30.7	11.680	11	2 13 1.90	1.9905	18 21 56.9	8.992
12	0 43 25.15	1.8365	10 10 10.3	11.642	12	2 15 1.46	1.9945	18 30 54.2	8.917
13	0 45 15.41	1.8389	10 21 47.8	11.605	13	2 17 1.26	1.9987	18 39 46.9	8.839
14	0 47 5.82	1.8413	10 33 22.9	11.566	14	2 19 1.31	2.0028	18 48 34.9	8.762
15	0 48 56.36	1.8436	10 44 55.7	11.526	15	2 21 1.60	2.0069	18 57 18.3	8.684
16	0 50 47.04	1.8460	10 56 26.0	11.485	16	2 23 2.14	2.0110	19 5 57.0	8.606
17	0 52 37.88	1.8485	11 7 53.8	11.443	17	2 25 2.92	2.0150	19 14 30.9	8.525
18	0 54 28.86	1.8510	11 19 19.1	11.401	18	2 27 3.95	2.0191	19 23 0.0	8.445
19	0 56 20.00	1.8537	11 30 41.9	11.357	19	2 29 5.22	2.0233	19 31 24.3	8.363
20	0 58 11.30	1.8563	11 42 2.0	11.313	20	2 31 6.75	2.0275	19 39 43.6	8.280
21	1 0 2.76	1.8590	11 53 19.5	11.268	21	2 33 8.53	2.0316	19 47 57.9	8.197
22	1 1 54.38	1.8617	12 4 34.2	11.223	22	2 35 10.55	2.0357	19 56 7.2	8.112
23	1 3 46.17	1.8646	12 15 46.2	11.177	23	2 37 12.82	2.0399	20 4 11.4	8.027
24	1 5 38.13	1.8674	N. 12° 26' 55.4"	11.130	24	2 39 15.34	2.0440	N. 20° 12' 10.5"	7.942

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	2 39 15.34	2.0440	N.20 12 10.5	7.942	0	4 21 56.41	2.2235	N.24 39 3.8	2.893
1	2 41 18.11	2.0482	20 20 4.4	7.855	1	4 24 9.91	2.2264	24 41 53.8	2.772
2	2 43 21.13	2.0523	20 27 53.1	7.767	2	4 26 23.58	2.2292	24 44 36.4	2.649
3	2 45 24.40	2.0565	20 35 36.5	7.678	3	4 28 37.42	2.2319	24 47 11.7	2.527
4	2 47 27.92	2.0607	20 43 14.5	7.589	4	4 30 51.41	2.2345	24 49 39.6	2.403
5	2 49 31.69	2.0649	20 50 47.2	7.500	5	4 33 5.56	2.2370	24 52 0.1	2.279
6	2 51 35.71	2.0690	20 58 14.4	7.407	6	4 35 19.86	2.2395	24 54 13.1	2.154
7	2 53 39.97	2.0730	21 5 36.1	7.316	7	4 37 34.20	2.2419	24 56 18.6	2.029
8	2 55 44.49	2.0773	21 12 52.3	7.223	8	4 39 48.89	2.2443	24 58 16.6	1.904
9	2 57 49.25	2.0813	21 20 2.9	7.127	9	4 42 3.62	2.2466	25 0 7.1	1.779
10	2 59 54.27	2.0856	21 27 7.8	7.032	10	4 44 18.49	2.2489	25 1 50.1	1.652
11	3 1 59.53	2.0897	21 34 7.2	6.930	11	4 46 33.49	2.2510	25 3 25.4	1.525
12	3 4 5.04	2.0939	21 41 0.9	6.846	12	4 48 48.61	2.2530	25 4 53.1	1.398
13	3 6 10.80	2.0980	21 47 48.8	6.749	13	4 51 3.86	2.2552	25 6 13.2	1.272
14	3 8 16.80	2.1020	21 54 30.8	6.651	14	4 53 19.23	2.2570	25 7 25.7	1.143
15	3 10 23.05	2.1061	22 1 6.9	6.552	15	4 55 34.71	2.2590	25 8 30.4	1.015
16	3 12 29.54	2.1101	22 7 37.1	6.453	16	4 57 50.31	2.2608	25 9 27.5	0.887
17	3 14 36.27	2.1142	22 14 1.3	6.353	17	5 0 6.01	2.2625	25 10 16.9	0.756
18	3 16 43.25	2.1182	22 20 19.5	6.252	18	5 2 21.82	2.2643	25 10 58.5	0.629
19	3 18 50.46	2.1222	22 26 31.6	6.151	19	5 4 37.73	2.2659	25 11 32.4	0.500
20	3 20 57.92	2.1263	22 32 37.6	6.049	20	5 6 53.73	2.2674	25 11 58.5	0.370
21	3 23 5.62	2.1302	22 38 37.5	5.946	21	5 9 9.82	2.2689	25 12 16.8	0.240
22	3 25 13.55	2.1341	22 44 31.1	5.842	22	5 11 26.00	2.2703	25 12 27.3	0.110
23	3 27 21.72	2.1380	N.22 50 18.5	5.737	23	5 13 42.26	2.2716	N.25 12 30.0	0.020
FRIDAY 10.					SUNDAY 12.				
0	3 29 30.12	2.1419	N.22 55 59.5	5.631	0	5 15 58.60	2.2739	N.25 12 24.9	0.151
1	3 31 38.75	2.1459	23 1 34.2	5.526	1	5 18 15.01	2.2740	25 12 11.9	0.282
2	3 33 47.62	2.1496	23 7 2.6	5.419	2	5 20 31.49	2.2752	25 11 51.1	0.412
3	3 35 56.71	2.1534	23 12 24.5	5.311	3	5 22 48.04	2.2762	25 11 22.4	0.543
4	3 38 6.03	2.1571	23 17 39.9	5.202	4	5 25 4.64	2.2771	25 10 45.9	0.674
5	3 40 15.57	2.1610	23 22 48.8	5.094	5	5 27 21.30	2.2780	25 10 1.5	0.806
6	3 42 25.34	2.1646	23 27 51.2	4.984	6	5 29 38.01	2.2788	25 9 9.2	0.937
7	3 44 35.33	2.1682	23 32 46.9	4.873	7	5 31 54.76	2.2796	25 8 9.0	1.069
8	3 46 45.53	2.1718	23 37 36.0	4.762	8	5 34 11.56	2.2803	25 7 0.9	1.202
9	3 48 55.95	2.1755	23 42 18.4	4.651	9	5 36 28.40	2.2809	25 5 44.8	1.333
10	3 51 6.59	2.1790	23 46 54.1	4.538	10	5 38 45.27	2.2814	25 4 20.9	1.465
11	3 53 17.44	2.1825	23 51 23.0	4.425	11	5 41 2.17	2.2819	25 2 49.0	1.597
12	3 55 28.49	2.1859	23 55 45.1	4.311	12	5 43 19.10	2.2823	25 1 9.3	1.728
13	3 57 39.75	2.1893	24 0 0.3	4.196	13	5 45 36.05	2.2825	24 59 21.6	1.861
14	3 59 51.21	2.1925	24 4 8.6	4.081	14	5 47 53.01	2.2828	24 57 26.0	1.992
15	4 2 2.88	2.1960	24 8 10.0	3.965	15	5 50 9.99	2.2830	24 55 22.5	2.125
16	4 4 14.74	2.1993	24 12 4.4	3.848	16	5 52 26.97	2.2830	24 53 11.0	2.257
17	4 6 26.80	2.2023	24 15 51.8	3.731	17	5 54 43.96	2.2831	24 50 51.6	2.389
18	4 8 39.05	2.2057	24 19 32.1	3.613	18	5 57 0.95	2.2830	24 48 24.3	2.521
19	4 10 51.49	2.2089	24 23 5.3	3.493	19	5 59 17.93	2.2829	24 45 49.1	2.652
20	4 13 4.12	2.2120	24 26 31.4	3.375	20	6 1 34.90	2.2827	24 43 6.0	2.784
21	4 15 16.93	2.2150	24 29 50.3	3.256	21	6 3 51.86	2.2825	24 40 15.0	2.916
22	4 17 29.92	2.2179	24 33 2.1	3.136	22	6 6 8.80	2.2822	24 37 16.1	3.047
23	4 19 43.08	2.2207	24 36 6.6	3.014	23	6 8 25.73	2.2819	24 34 9.3	3.178
24	4 21 56.41	2.2235	N.24 39 3.8	2.893	24	6 10 42.63	2.2814	N.24 30 54.7	3.309

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	6 10 42.63	2.3814	N.24° 30' 54.7	2.309	0	7 58 42.53	2.2044	N.19° 27' 10.7	9.189
1	6 12 59.50	2.3809	24 27 32.2	2.441	1	8 0 54.73	2.2022	19 17 57.9	9.287
2	6 15 16.34	2.3808	24 24 1.8	2.572	2	8 3 6.80	2.2000	19 8 38.7	9.373
3	6 17 33.14	2.3798	24 20 23.6	2.703	3	8 5 18.73	2.1978	18 59 13.1	9.474
4	6 19 49.90	2.3790	24 16 37.5	2.833	4	8 7 30.54	2.1956	18 49 41.2	9.586
5	6 22 6.62	2.3782	24 12 43.6	2.964	5	8 9 42.21	2.1935	18 40 2.9	9.690
6	6 24 23.29	2.3774	24 8 41.8	3.096	6	8 11 53.76	2.1913	18 30 18.4	9.794
7	6 26 39.91	2.3768	24 4 32.4	3.229	7	8 14 5.17	2.1890	18 20 27.6	9.898
8	6 28 56.47	2.3758	24 0 15.1	3.362	8	8 16 16.45	2.1869	18 10 30.7	10.000
9	6 31 12.97	2.3748	23 55 50.1	3.493	9	8 18 27.60	2.1847	18 0 27.6	10.102
10	6 33 29.42	2.3738	23 51 17.3	3.611	10	8 20 38.62	2.1826	17 50 18.5	10.202
11	6 35 45.80	2.3734	23 46 36.8	3.738	11	8 22 49.51	2.1804	17 40 3.3	10.303
12	6 38 2.11	2.3712	23 41 48.7	3.866	12	8 25 0.26	2.1782	17 29 42.2	10.402
13	6 40 18.35	2.3700	23 36 52.9	3.994	13	8 27 10.89	2.1761	17 19 15.1	10.500
14	6 42 34.51	2.3687	23 31 49.4	4.123	14	8 29 21.40	2.1740	17 8 42.2	10.597
15	6 44 50.60	2.3676	23 26 38.3	4.249	15	8 31 31.78	2.1719	16 58 3.4	10.694
16	6 47 6.61	2.3660	23 21 19.5	4.377	16	8 33 42.03	2.1698	16 47 18.8	10.791
17	6 49 22.53	2.3646	23 15 53.1	4.503	17	8 35 52.16	2.1778	16 36 28.5	10.886
18	6 51 38.37	2.3632	23 10 19.2	4.628	18	8 38 2.17	2.1658	16 25 32.6	10.979
19	6 53 54.12	2.3618	23 4 37.7	4.754	19	8 40 12.06	2.1639	16 24 31.0	11.073
20	6 56 9.77	2.3600	22 58 48.7	4.879	20	8 42 21.84	2.1619	16 3 23.8	11.166
21	6 58 25.33	2.3586	22 52 52.2	5.004	21	8 44 31.49	2.1599	15 52 11.1	11.258
22	7 0 40.79	2.3569	22 46 48.2	5.128	22	8 46 41.03	2.1580	15 40 52.9	11.349
23	7 2 56.16	2.3553	N.22° 40' 36.8	5.253	23	8 48 50.45	2.1560	N.15° 29' 29.2	11.439
TUESDAY 14.					THURSDAY 16.				
0	7 5 11.42	2.3538	N.22° 34' 17.9	5.376	0	8 50 59.76	2.1543	N.15° 18' 0.2	11.527
1	7 7 26.58	2.3517	22 27 51.7	5.497	1	8 53 8.96	2.1524	15 6 25.9	11.616
2	7 9 41.63	2.3500	22 21 18.2	5.619	2	8 55 18.05	2.1508	14 54 46.3	11.707
3	7 11 56.58	2.3481	22 14 37.4	5.741	3	8 57 27.03	2.1488	14 43 1.5	11.790
4	7 14 11.41	2.3468	22 7 49.3	5.863	4	8 59 35.91	2.1471	14 31 11.5	11.876
5	7 16 26.13	2.3444	22 0 53.9	5.983	5	9 1 44.69	2.1454	14 19 16.4	11.960
6	7 18 40.74	2.3426	21 53 51.3	6.108	6	9 3 53.36	2.1437	14 7 16.3	12.043
7	7 20 55.23	2.3408	21 46 41.5	6.223	7	9 6 1.94	2.1421	13 55 11.2	12.126
8	7 23 9.60	2.3386	21 39 24.6	6.343	8	9 8 10.42	2.1409	13 43 1.1	12.209
9	7 25 23.85	2.3368	21 32 0.5	6.460	9	9 10 18.81	2.1390	13 30 46.1	12.290
10	7 27 37.98	2.3348	21 24 29.4	6.577	10	9 12 27.11	2.1376	13 18 26.3	12.368
11	7 29 51.99	2.3328	21 16 51.2	6.695	11	9 14 35.32	2.1360	13 6 1.8	12.448
12	7 32 5.88	2.3304	21 9 6.0	6.812	12	9 16 43.44	2.1346	12 53 32.5	12.527
13	7 34 19.64	2.3282	21 1 13.8	6.927	13	9 18 51.48	2.1333	12 40 58.6	12.604
14	7 36 33.28	2.3262	20 53 14.7	7.043	14	9 20 59.44	2.1320	12 28 20.0	12.681
15	7 38 46.79	2.3240	20 45 8.7	7.157	15	9 23 7.32	2.1307	12 15 36.9	12.756
16	7 41 0.17	2.3219	20 36 55.8	7.273	16	9 25 15.13	2.1296	12 2 49.4	12.829
17	7 43 13.42	2.3197	20 28 36.1	7.385	17	9 27 22.86	2.1283	11 49 57.4	12.902
18	7 45 26.54	2.3178	20 20 9.6	7.497	18	9 29 30.53	2.1272	11 37 1.1	12.976
19	7 47 39.54	2.3156	20 11 36.5	7.609	19	9 31 38.13	2.1260	11 24 0.4	13.047
20	7 49 52.40	2.3132	20 2 56.5	7.621	20	9 33 45.66	2.1250	11 10 55.5	13.117
21	7 52 5.13	2.3110	19 54 9.9	7.732	21	9 35 53.13	2.1240	10 57 46.4	13.187
22	7 54 17.73	2.3087	19 45 16.7	7.841	22	9 38 0.55	2.1232	10 44 33.1	13.255
23	7 56 30.20	2.3068	19 36 17.0	7.950	23	9 40 7.92	2.1224	10 31 15.8	13.322
24	7 58 42.53	2.3044	N.19° 27' 10.7	8.160	24	9 42 15.24	2.1215	N.10° 17' 54.5	13.388

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	9 42 15.24	2.1215	N. 10° 17' 54.5"	13.388	0	11 24 22.45	2.1606	S. 1° 20' 11.3"	15.226
1	9 44 22.51	2.1207	10 4 29.2	13.454	1	11 26 32.16	2.1623	1 35 25.7	15.242
2	9 46 29.73	2.1201	9 51 0.0	13.518	2	11 28 42.04	2.1600	1 50 40.4	15.247
3	9 48 36.92	2.1195	9 37 27.0	13.582	3	11 30 52.08	2.1787	2 5 55.4	15.262
4	9 50 44.07	2.1188	9 23 50.2	13.644	4	11 33 2.29	2.1715	2 21 10.6	15.266
5	9 52 51.19	2.1184	9 10 9.7	13.705	5	11 35 12.67	2.1745	2 36 26.0	15.268
6	9 54 58.28	2.1179	8 56 25.6	13.765	6	11 37 23.23	2.1775	2 51 41.3	15.265
7	9 57 5.34	2.1175	8 42 37.9	13.824	7	11 39 33.98	2.1806	3 6 56.6	15.264
8	9 59 12.38	2.1171	8 28 46.7	13.882	8	11 41 44.91	2.1837	3 22 11.8	15.261
9	10 1 19.40	2.1169	8 14 52.0	13.939	9	11 43 56.03	2.1870	3 37 26.7	15.246
10	10 3 26.41	2.1166	8 0 54.0	13.994	10	11 46 7.35	2.1903	3 52 41.3	15.240
11	10 5 33.40	2.1165	7 46 52.7	14.049	11	11 48 18.87	2.1936	4 7 55.6	15.239
12	10 7 40.39	2.1165	7 32 48.1	14.103	12	11 50 30.59	2.1970	4 23 9.3	15.223
13	10 9 47.38	2.1165	7 18 40.3	14.156	13	11 52 42.52	2.2005	4 38 22.3	15.211
14	10 11 54.37	2.1165	7 4 29.3	14.207	14	11 54 54.66	2.2041	4 53 34.6	15.198
15	10 14 1.36	2.1165	6 50 15.3	14.257	15	11 57 7.03	2.2079	5 8 46.1	15.184
16	10 16 8.36	2.1167	6 35 58.4	14.307	16	11 59 19.63	2.2117	5 23 56.7	15.168
17	10 18 15.37	2.1170	6 21 38.5	14.355	17	12 1 32.45	2.2155	5 39 6.3	15.151
18	10 20 22.40	2.1173	6 7 15.8	14.402	18	12 3 45.50	2.2194	5 54 14.8	15.131
19	10 22 29.45	2.1171	5 52 50.3	14.447	19	12 5 58.78	2.2234	6 9 21.9	15.110
20	10 24 36.53	2.1180	5 38 22.2	14.493	20	12 8 12.31	2.2275	6 24 27.8	15.087
21	10 26 43.64	2.1187	5 23 51.3	14.536	21	12 10 26.08	2.2315	6 39 32.3	15.068
22	10 28 50.78	2.1192	5 9 17.9	14.577	22	12 12 40.10	2.2356	6 54 35.4	15.037
23	10 30 57.95	2.1199	N. 4 54 42.0	14.618	23	12 14 54.38	2.2400	S. 7 9 36.9	15.010
SATURDAY 18.					MONDAY 20.				
0	10 33 5.17	2.1206	N. 4 40 3.7	14.658	0	12 17 8.91	2.2443	S. 7 24 36.8	14.961
1	10 35 12.43	2.1214	4 25 23.0	14.697	1	12 19 23.70	2.2487	7 39 34.7	14.950
2	10 37 19.74	2.1223	4 10 40.0	14.735	2	12 21 38.76	2.2532	7 54 30.8	14.917
3	10 39 27.11	2.1233	3 55 54.8	14.854	3	12 23 54.09	2.2578	8 9 24.8	14.883
4	10 41 34.54	2.1243	3 41 7.5	14.907	4	12 26 9.70	2.2624	8 24 16.6	14.845
5	10 43 42.03	2.1254	3 26 18.0	14.941	5	12 28 25.58	2.2770	8 39 6.2	14.807
6	10 45 49.59	2.1265	3 11 26.6	14.973	6	12 30 41.75	2.2718	8 53 53.5	14.767
7	10 47 57.22	2.1278	2 56 33.2	14.904	7	12 32 58.20	2.2765	9 8 38.3	14.726
8	10 50 4.93	2.1291	2 41 38.1	14.934	8	12 35 14.94	2.2814	9 23 20.5	14.683
9	10 52 12.72	2.1305	2 26 41.1	14.963	9	12 37 31.97	2.2864	9 38 0.1	14.637
10	10 54 20.60	2.1320	2 11 42.5	14.990	10	12 39 49.31	2.2914	9 52 36.9	14.590
11	10 56 28.56	2.1333	1 56 42.2	15.017	11	12 42 6.94	2.2964	10 7 10.8	14.540
12	10 58 36.62	2.1351	1 41 40.3	15.042	12	12 44 24.88	2.3015	10 21 41.7	14.490
13	11 0 44.78	2.1369	1 26 37.1	15.065	13	12 46 43.12	2.3066	10 36 9.6	14.437
14	11 2 53.05	2.1388	1 11 32.5	15.087	14	12 49 1.68	2.3119	10 50 34.2	14.382
15	11 5 1.42	2.1408	0 56 26.6	15.108	15	12 51 20.55	2.3170	11 4 55.5	14.326
16	11 7 9.91	2.1424	0 41 19.5	15.128	16	12 53 39.73	2.3223	11 19 13.3	14.267
17	11 9 18.51	2.1444	0 26 11.2	15.147	17	12 55 59.23	2.3276	11 33 27.6	14.208
18	11 11 27.24	2.1465	N. 0 11 1.9	15.163	18	12 58 19.05	2.3330	11 47 38.3	14.147
19	11 13 36.09	2.1485	S. 0 4 8.4	15.179	19	13 0 39.20	2.3385	12 1 45.2	14.082
20	11 15 45.08	2.1508	0 19 19.6	15.193	20	13 2 59.68	2.3440	12 15 48.2	14.017
21	11 17 54.20	2.1532	0 34 31.6	15.206	21	13 5 20.49	2.3495	12 29 47.2	13.949
22	11 20 3.47	2.1557	0 49 44.3	15.217	22	13 7 41.64	2.3552	12 43 42.1	13.880
23	11 22 12.89	2.1581	1 4 57.6	15.227	23	13 10 3.12	2.3608	12 57 32.8	13.806
24	11 24 22.45	2.1606	S. 1 20 11.5	15.236	24	13 12 24.94	2.3665	S. 13 11 19.1	13.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	h m s 13 12 24.94	2.3666	S. 13° 11' 19.1"	13.734	0	h m s 15 12 40.97	2.6340	S. 22° 9' 23.4"	7.979
1	13 14 47.10	2.3721	13 25 0.9	13.689	1	15 15 19.14	2.6382	22 17 17.3	7.817
2	13 17 9.60	2.3779	13 38 38.2	13.563	2	15 17 57.56	2.6423	22 25 1.5	7.655
3	13 19 32.45	2.3837	13 52 10.8	13.503	3	15 20 36.22	2.6464	22 32 35.9	7.491
4	13 21 55.65	2.3895	14 5 38.6	13.422	4	15 23 15.13	2.6504	22 40 0.4	7.325
5	13 24 19.19	2.3952	14 19 1.4	13.338	5	15 25 54.27	2.6541	22 47 14.9	7.158
6	13 26 43.08	2.4011	14 32 19.2	13.263	6	15 28 33.63	2.6577	22 54 19.4	6.991
7	13 29 7.33	2.4076	14 45 31.8	13.187	7	15 31 13.20	2.6611	23 1 13.8	6.822
8	13 31 31.93	2.4137	14 58 39.2	13.077	8	15 33 52.97	2.6645	23 7 58.0	6.651
9	13 33 56.88	2.4198	15 11 41.1	12.965	9	15 36 32.95	2.6679	23 14 31.9	6.479
10	13 36 22.19	2.4247	15 24 37.6	12.862	10	15 39 13.12	2.6710	23 20 55.5	6.307
11	13 38 47.85	2.4295	15 37 27.9	12.798	11	15 41 53.47	2.6740	23 27 8.8	6.134
12	13 41 13.87	2.4355	15 50 13.3	12.702	12	15 44 34.00	2.6769	23 33 11.6	5.960
13	13 43 40.25	2.4426	16 2 52.5	12.608	13	15 47 14.70	2.6795	23 39 4.0	5.785
14	13 46 6.99	2.4485	16 15 25.7	12.502	14	15 49 55.55	2.6820	23 44 45.7	5.609
15	13 48 34.08	2.4545	16 27 52.8	12.400	15	15 52 36.56	2.6845	23 50 16.9	5.431
16	13 51 1.54	2.4605	16 40 13.7	12.295	16	15 55 17.70	2.6868	23 55 37.4	5.252
17	13 53 29.36	2.4665	16 52 28.2	12.187	17	15 57 58.98	2.6890	24 0 47.2	5.074
18	13 55 57.53	2.4725	17 4 36.2	12.079	18	16 0 40.38	2.6909	24 5 46.3	4.895
19	13 58 26.06	2.4785	17 16 37.7	11.969	19	16 3 21.89	2.6926	24 10 34.6	4.715
20	14 0 54.95	2.4845	17 28 32.5	11.876	20	16 6 3.50	2.6944	24 15 12.1	4.533
21	14 3 24.20	2.4904	17 40 20.5	11.742	21	16 8 45.22	2.6960	24 19 38.6	4.352
22	14 5 53.80	2.4963	17 52 1.6	11.623	22	16 11 27.02	2.6975	24 23 54.3	4.170
23	14 8 23.75	2.5021	S. 18° 3' 35.6"	11.507	23	16 14 8.89	2.6989	S. 24° 27' 59.1"	3.988
WEDNESDAY 22.					FRIDAY 24.				
0	h m s 14 10 54.06	2.5080	S. 18° 15' 2.5"	11.389	0	h m s 16 16 50.82	2.6998	S. 24° 31' 52.9"	3.806
1	14 13 24.72	2.5139	18 26 22.3	11.266	1	16 19 32.81	2.7008	24 35 35.7	3.622
2	14 15 55.73	2.5198	18 37 34.4	11.140	2	16 22 14.85	2.7009	24 39 7.5	3.438
3	14 18 27.10	2.5256	18 48 39.1	11.016	3	16 24 56.92	2.7013	24 42 28.3	3.255
4	14 20 58.81	2.5314	18 59 36.3	10.889	4	16 27 39.01	2.7015	24 45 38.1	3.071
5	14 23 30.87	2.5370	19 10 25.8	10.760	5	16 30 21.11	2.7017	24 48 36.8	2.887
6	14 26 3.26	2.5427	19 21 7.5	10.628	6	16 33 3.22	2.7018	24 51 24.5	2.702
7	14 28 36.00	2.5484	19 31 41.3	10.494	7	16 35 45.33	2.7017	24 54 1.1	2.518
8	14 31 9.07	2.5540	19 42 7.0	10.359	8	16 38 27.43	2.7014	24 56 26.7	2.333
9	14 33 42.48	2.5596	19 52 24.6	10.224	9	16 41 9.50	2.7008	24 58 41.1	2.148
10	14 36 16.22	2.5650	20 2 33.9	10.086	10	16 43 51.53	2.7000	25 0 44.5	1.964
11	14 38 50.28	2.5704	20 12 34.9	9.947	11	16 46 33.50	2.6990	25 2 36.8	1.779
12	14 41 24.67	2.5758	20 22 27.5	9.805	12	16 49 15.42	2.6981	25 4 18.0	1.594
13	14 43 59.38	2.5811	20 32 11.5	9.661	13	16 51 57.28	2.6969	25 5 48.1	1.408
14	14 46 34.41	2.5864	20 41 46.8	9.516	14	16 54 39.05	2.6954	25 7 7.1	1.225
15	14 49 9.75	2.5915	20 51 13.4	9.370	15	16 57 20.73	2.6938	25 8 15.1	1.041
16	14 51 45.39	2.5965	21 0 31.2	9.223	16	17 0 2.31	2.6921	25 9 12.0	0.857
17	14 54 21.34	2.6016	21 9 40.0	9.072	17	17 2 43.79	2.6902	25 9 57.9	0.674
18	14 56 57.60	2.6064	21 18 39.8	8.920	18	17 5 25.14	2.6880	25 10 32.9	0.492
19	14 59 34.13	2.6112	21 27 30.4	8.767	19	17 8 6.36	2.6858	25 10 56.9	0.309
20	15 2 10.93	2.6160	21 36 11.8	8.613	20	17 10 47.44	2.6835	25 11 10.0	0.127
21	15 4 48.03	2.6208	21 44 43.9	8.457	21	17 13 28.38	2.6809	25 11 12.1	0.053
22	15 7 25.41	2.6253	21 53 6.6	8.309	22	17 16 9.15	2.6780	25 11 3.4	0.026
23	15 10 3.06	2.6298	22 1 19.8	8.140	23	17 18 49.75	2.6760	25 10 43.8	0.416
24	15 12 40.97	2.6340	S. 22° 9' 23.4"	7.979	24	17 21 30.17	2.6721	S. 25° 10' 13.5"	0.095

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	17 21 30.17	2.6721	S. 25° 10' 13.5"	0.596	0	19 23 42.97	2.3699	S. 21° 34' 16.0"	7.993
1	17 24 10.40	2.6688	25 9 32.3	0.776	1	19 26 5.78	2.3763	21 26 19.5	7.999
2	17 26 50.43	2.6655	25 8 40.4	0.954	2	19 28 28.13	2.3827	21 18 16.1	8.112
3	17 29 30.25	2.6619	25 7 37.8	1.132	3	19 30 50.03	2.3810	21 10 6.0	8.226
4	17 32 9.86	2.6582	25 6 24.6	1.309	4	19 33 11.46	2.3854	21 1 49.1	8.337
5	17 34 49.24	2.6543	25 5 0.7	1.486	5	19 35 32.44	2.3486	20 53 25.6	8.446
6	17 37 28.38	2.6502	25 3 26.3	1.661	6	19 37 52.96	2.3900	20 44 55.6	8.553
7	17 40 7.27	2.6460	25 1 41.4	1.835	7	19 40 13.01	2.3903	20 36 19.2	8.659
8	17 42 45.91	2.6418	24 59 46.1	2.009	8	19 42 32.60	2.3926	20 27 36.5	8.763
9	17 45 24.29	2.6376	24 57 40.3	2.182	9	19 44 51.73	2.3161	20 18 47.6	8.866
10	17 48 2.39	2.6326	24 55 24.3	2.353	10	19 47 10.41	2.3074	20 9 52.6	8.967
11	17 50 40.21	2.6280	24 52 58.0	2.523	11	19 49 28.62	2.2997	20 0 51.5	9.066
12	17 53 17.75	2.6231	24 50 21.6	2.692	12	19 51 46.38	2.2921	19 51 44.5	9.163
13	17 55 54.99	2.6181	24 47 35.0	2.861	13	19 54 3.68	2.2846	19 42 31.7	9.261
14	17 58 31.93	2.6130	24 44 38.3	3.027	14	19 56 20.52	2.2769	19 33 13.2	9.356
15	18 1 8.55	2.6076	24 41 31.7	3.192	15	19 58 36.91	2.2692	19 23 49.0	9.450
16	18 3 44.85	2.6023	24 38 15.2	3.357	16	20 0 52.84	2.2617	19 14 19.2	9.542
17	18 6 20.83	2.5968	24 34 48.8	3.522	17	20 3 8.32	2.2542	19 4 44.0	9.632
18	18 8 56.47	2.5911	24 31 12.6	3.684	18	20 5 23.35	2.2467	18 55 3.4	9.721
19	18 11 31.77	2.5855	24 27 26.7	3.845	19	20 7 37.93	2.2392	18 45 17.5	9.807
20	18 14 6.73	2.5796	24 23 31.2	4.006	20	20 9 52.06	2.2317	18 35 26.5	9.892
21	18 16 41.33	2.5736	24 19 26.1	4.163	21	20 12 5.74	2.2243	18 25 30.4	9.978
22	18 19 15.57	2.5675	24 15 11.6	4.321	22	20 14 18.98	2.2170	18 15 29.2	10.061
23	18 21 49.44	2.5614	S. 24° 10' 47.6"	4.477	23	20 16 31.78	2.2096	S. 18° 5' 23.1"	10.143
SUNDAY 26.					TUESDAY 28.				
0	18 24 22.94	2.5551	S. 24° 6' 14.4"	4.631	0	20 18 44.14	2.2023	S. 17° 55' 12.2"	10.221
1	18 26 56.06	2.5488	24 1 31.9	4.784	1	20 20 56.06	2.1950	17 44 56.6	10.299
2	18 29 28.80	2.5424	23 56 40.3	4.935	2	20 23 7.54	2.1877	17 34 36.3	10.377
3	18 32 1.15	2.5358	23 51 39.7	5.085	3	20 25 18.59	2.1806	17 24 11.4	10.452
4	18 34 33.10	2.5291	23 46 30.1	5.234	4	20 27 29.22	2.1735	17 13 42.1	10.526
5	18 37 4.65	2.5225	23 41 11.6	5.382	5	20 29 39.41	2.1663	17 3 8.3	10.599
6	18 39 35.80	2.5157	23 35 44.3	5.527	6	20 31 49.18	2.1592	16 52 30.3	10.669
7	18 42 6.54	2.5089	23 30 8.3	5.671	7	20 33 58.53	2.1523	16 41 48.1	10.738
8	18 44 36.87	2.5020	23 24 23.8	5.813	8	20 36 7.46	2.1453	16 31 1.7	10.807
9	18 47 6.78	2.4949	23 18 30.7	5.953	9	20 38 15.97	2.1383	16 20 11.3	10.873
10	18 49 36.26	2.4878	23 12 29.2	6.095	10	20 40 24.08	2.1316	16 9 16.9	10.939
11	18 52 5.32	2.4807	23 6 19.3	6.233	11	20 42 31.78	2.1250	15 58 18.6	11.003
12	18 54 33.95	2.4735	23 0 1.2	6.369	12	20 44 39.08	2.1183	15 47 16.5	11.066
13	18 57 2.15	2.4663	22 53 35.0	6.504	13	20 46 45.98	2.1116	15 36 10.7	11.127
14	18 59 29.91	2.4590	22 47 0.7	6.638	14	20 48 52.48	2.1050	15 25 1.2	11.187
15	19 1 57.23	2.4516	22 40 18.4	6.770	15	20 50 58.59	2.0985	15 13 48.2	11.247
16	19 4 24.11	2.4442	22 33 28.3	6.900	16	20 53 4.31	2.0920	15 2 31.6	11.305
17	19 6 50.54	2.4368	22 26 30.4	7.028	17	20 55 9.64	2.0856	14 51 11.6	11.362
18	19 9 16.53	2.4294	22 19 24.9	7.156	18	20 57 14.59	2.0793	14 39 48.2	11.417
19	19 11 42.07	2.4221	22 12 11.8	7.281	19	20 59 19.16	2.0730	14 28 21.6	11.470
20	19 14 7.16	2.4144	22 4 51.2	7.406	20	21 1 23.35	2.0667	14 16 51.8	11.522
21	19 16 31.80	2.4068	21 57 23.2	7.527	21	21 3 27.17	2.0605	14 5 18.9	11.574
22	19 18 55.98	2.3992	21 49 48.0	7.647	22	21 5 30.62	2.0544	13 53 42.9	11.624
23	19 21 19.71	2.3915	21 42 5.5	7.766	23	21 7 33.70	2.0483	13 42 4.0	11.673
24	19 23 42.97	2.3839	S. 21° 34' 16.0"	7.883	24	21 9 36.42	2.0424	S. 13° 30' 22.1"	11.722

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
WEDNESDAY 29.					FRIDAY 31.				
0	21 9 36.42	2.0424	S. 13 30 22.1	11.722	0	22 42 7.66	1.8416	S. 3 32 30.8	12.888
1	21 11 38.79	2.0365	13 18 37.4	11.767	1	22 43 58.08	1.8391	3 19 40.4	12.843
2	21 13 40.80	2.0306	13 6 50.0	11.812	2	22 45 48.36	1.8366	3 6 49.8	12.843
3	21 15 42.46	2.0248	12 54 59.9	11.857	3	22 47 38.50	1.8346	2 53 59.2	12.844
4	21 17 43.78	2.0191	12 43 7.2	11.900	4	22 49 28.52	1.8326	2 41 8.5	12.845
5	21 19 44.76	2.0135	12 31 11.9	11.942	5	22 51 18.42	1.8306	2 28 17.8	12.844
6	21 21 45.40	2.0079	12 19 14.2	11.982	6	22 53 8.20	1.8286	2 15 27.2	12.843
7	21 23 45.71	2.0024	12 7 14.0	12.023	7	22 54 57.86	1.8266	2 2 36.6	12.842
8	21 25 45.69	1.9970	11 55 11.4	12.062	8	22 56 47.40	1.8248	1 49 46.1	12.840
9	21 27 45.35	1.9916	11 43 6.5	12.100	9	22 58 36.84	1.8231	1 36 55.8	12.837
10	21 29 44.69	1.9864	11 30 59.4	12.137	10	23 0 26.18	1.8216	1 24 5.6	12.834
11	21 31 43.72	1.9811	11 18 50.1	12.172	11	23 2 15.42	1.8199	1 11 15.7	12.830
12	21 33 42.43	1.9760	11 6 38.8	12.206	12	23 4 4.57	1.8184	0 58 26.0	12.826
13	21 35 40.84	1.9710	10 54 25.4	12.239	13	23 5 53.63	1.8169	0 45 36.7	12.819
14	21 37 38.95	1.9660	10 42 10.1	12.272	14	23 7 42.60	1.8164	0 32 47.7	12.818
15	21 39 36.76	1.9610	10 29 52.8	12.303	15	23 9 31.49	1.8143	0 19 59.1	12.807
16	21 41 34.28	1.9562	10 17 33.7	12.333	16	23 11 20.31	1.8130	S. 0 7 10.9	12.799
17	21 43 31.51	1.9515	10 5 12.8	12.362	17	23 13 9.06	1.8116	N. 0 5 36.8	12.791
18	21 45 28.46	1.9468	9 52 50.2	12.391	18	23 14 57.74	1.8107	0 18 24.0	12.782
19	21 47 25.13	1.9421	9 40 25.9	12.419	19	23 16 46.35	1.8096	0 31 10.7	12.771
20	21 49 21.52	1.9375	9 27 59.9	12.446	20	23 18 34.90	1.8087	0 43 56.7	12.760
21	21 51 17.64	1.9331	9 15 32.4	12.472	21	23 20 23.40	1.8079	0 56 42.2	12.749
22	21 53 13.50	1.9288	9 3 3.3	12.497	22	23 22 11.85	1.8070	1 9 27.0	12.737
23	21 55 9.10	1.9246	S. 8 50 32.8	12.520	23	23 24 0.25	1.8064	N. 1 22 11.0	12.737
THURSDAY 30.					SATURDAY, JUNE 1.				
0	21 57 4.44	1.9202	S. 8 38 0.9	12.542	0	23 25 48.62	1.8058	N. 1 34 54.4	12.716
1	21 58 59.53	1.9160	8 25 27.7	12.564					
2	22 0 54.37	1.9120	8 12 53.2	12.586					
3	22 2 48.97	1.9080	8 0 17.4	12.606					
4	22 4 43.34	1.9041	7 47 40.5	12.624					
5	22 6 37.47	1.9002	7 35 2.5	12.642					
6	22 8 31.37	1.8964	7 22 23.4	12.661					
7	22 10 25.04	1.8927	7 9 43.2	12.677					
8	22 12 18.50	1.8891	6 57 2.1	12.693					
9	22 14 11.74	1.8855	6 44 20.0	12.708					
10	22 16 4.77	1.8820	6 31 37.1	12.722					
11	22 17 57.59	1.8787	6 18 53.3	12.736					
12	22 19 50.22	1.8755	6 6 8.8	12.748					
13	22 21 42.65	1.8722	5 53 23.5	12.760					
14	22 23 34.89	1.8690	5 40 37.6	12.771					
15	22 25 26.93	1.8659	5 27 51.0	12.782					
16	22 27 18.80	1.8628	5 15 3.8	12.791					
17	22 29 10.48	1.8599	5 2 16.1	12.799					
18	22 31 1.99	1.8571	4 49 27.9	12.807					
19	22 32 53.34	1.8544	4 36 39.3	12.814					
20	22 34 44.52	1.8516	4 23 50.2	12.821					
21	22 36 35.54	1.8490	4 11 0.8	12.827					
22	22 38 26.40	1.8463	3 58 11.0	12.832					
23	22 40 17.10	1.8436	3 45 21.0	12.838					
24	22 42 7.66	1.8416	S. 3 32 30.8	12.838					

PHASES OF THE MOON.

☾ Last Quarter, . . .	d	h	m
● New Moon, . . .	9	11	7.5
☾ First Quarter, . . .	17	4	3.3
☾ Full Moon, . . .	23	18	6.2
☾ Last Quarter, . . .	30	22	25.3

☾ Apogee,	d	h
☾ Perigee,	22	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
1	Antares W.	59° 51' 18"	2763	61° 26' 35"	2779	63° 1' 31"	2794	64° 36' 7"	2808
	α Pegasi E.	46 35 56	3065	45 6 51	3087	43 38 25	3119	42 10 39	3154
	SUN E.	93 39 41	3120	92 11 56	3188	90 44 32	3153	89 17 27	3189
2	Antares W.	72 24 32	2976	73 57 21	2989	75 29 54	2991	77 2 11	2912
	α Aquilæ W.	32 37 37	3810	33 24 51	3875	34 14 43	3870	35 6 59	3191
	α Pegasi E.	35 3 18	3371	33 40 28	3435	32 18 40	3498	30 58 0	3463
	SUN E.	82 6 40	3244	80 41 23	3297	79 16 21	3270	77 51 35	3294
3	Antares W.	84 40 5	2968	86 11 0	2975	87 41 44	2984	89 12 17	2988
	α Aquilæ W.	39 57 41	4666	41 0 35	4480	42 4 45	4401	43 10 5	4330
	SUN E.	70 51 22	3341	69 27 58	3351	68 4 46	3361	66 41 45	3373
4	Antares W.	96 42 32	3029	98 12 9	3034	99 41 39	3040	101 11 2	3045
	α Aquilæ W.	48 51 4	4069	50 1 36	4030	51 12 46	3993	52 24 32	3980
	Fomalhaut W.	28 9 57	6201	28 53 7	5894	29 39 27	5633	30 28 40	5407
	SUN E.	59 49 16	3413	58 27 13	3419	57 5 18	3426	55 43 31	3433
5	α Aquilæ W.	58 30 42	3835	59 45 8	3815	60 59 55	3796	62 15 1	3780
	Fomalhaut W.	35 9 45	4636	36 11 39	4630	37 15 5	4435	38 19 55	4360
	SUN E.	48 56 13	3458	47 35 2	3463	46 13 56	3468	44 52 54	3471
6	α Aquilæ W.	68 34 35	3709	69 51 12	3696	71 8 1	3687	72 25 2	3677
	Fomalhaut W.	44 1 19	4034	45 12 25	3986	46 24 18	3843	47 36 54	3664
	SUN E.	38 8 44	3496	36 48 4	3498	35 27 27	3491	34 6 53	3498
7	α Aquilæ W.	78 52 30	3637	80 10 24	3631	81 26 25	3624	82 46 33	3616
	Fomalhaut W.	53 49 2	3748	55 5 0	3731	56 21 25	3697	57 38 15	3676
	SUN E.	27 24 45	3506	26 4 30	3513	24 44 20	3518	23 24 16	3524
11	SUN W.	17 20 40	3425	18 42 28	3401	20 4 43	3380	21 27 22	3362
	Pollux E.	43 28 13	3018	41 58 23	3016	40 28 30	3015	38 58 36	3014
	Jupiter E.	70 23 19	2983	68 52 44	2977	67 22 2	2970	65 51 12	2964
	Regulus E.	80 5 7	2952	78 33 54	2946	77 2 33	2939	75 31 4	2933
	Saturn E.	84 48 33	2969	83 17 40	2962	81 46 39	2956	80 15 30	2948
12	SUN W.	28 25 24	2288	29 49 49	2276	31 14 29	2264	32 39 23	2253
	Pollux E.	31 29 3	3023	29 59 17	3028	28 29 39	3026	27 0 11	3046
	Jupiter E.	58 14 57	2980	56 43 16	2923	55 11 26	2916	53 39 27	2909
	Regulus E.	67 51 32	2989	66 19 10	2991	64 46 39	2983	63 13 58	2976
	Saturn E.	72 37 34	2914	71 5 33	2907	69 33 23	2900	68 1 4	2893
13	SUN W.	39 47 16	3196	41 13 31	3183	42 40 0	3173	44 6 42	3161
	Jupiter E.	45 57 9	2971	44 24 13	2963	42 51 7	2955	41 17 50	2947
	Regulus E.	55 28 5	2936	53 54 23	2937	52 20 30	2919	50 46 27	2911
	Saturn E.	60 17 4	2955	58 43 47	2946	57 10 19	2938	55 36 41	2930
	Spica E.	109 30 15	2927	107 56 22	2918	106 22 17	2908	104 48 0	2798
14	SUN W.	51 23 38	3104	52 51 43	3091	54 20 3	3080	55 48 37	3068
	Mars W.	18 1 39	2973	19 32 26	2962	21 3 27	2950	22 34 43	2939
	Jupiter E.	33 28 56	2910	31 54 41	2903	30 20 17	2797	28 45 45	2791
	Regulus E.	42 53 24	2768	41 18 14	2760	39 42 53	2761	38 7 21	2742
	Saturn E.	47 45 54	2791	46 11 14	2762	44 36 23	2775	43 1 22	2766
	Spica E.	96 53 28	2751	95 17 56	2741	93 42 10	2730	92 6 10	2719

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DIST.	XVh.	P. L. of DIST.	XVIIIh.	P. L. of DIST.	XXIh.	P. L. of DIST.
1	Antares W.	66° 10' 24"	2922	67° 44' 23"	2928	69° 18' 4"	2930	70° 51' 27"	2934
	α Pegasi E.	40 43 35	2193	39 17 17	2222	37 51 46	2275	36 27 5	2321
	SUN E.	87 50 41	2186	86 24 14	2200	84 58 5	2215	83 32 14	2220
2	Antares W.	78 34 14	2924	80 6 2	2925	81 37 36	2945	83 8 57	2966
	α Aquilæ W.	36 1 27	2035	36 57 55	2095	37 56 13	2174	38 56 11	2264
	α Pegasi E.	29 38 33	2026	28 20 27	2111	27 3 52	2095	25 48 58	2019
3	SUN E.	76 27 5	2206	75 2 49	2208	73 38 47	2219	72 14 58	2221
	Antares W.	90 42 39	2901	92 12 51	2909	93 42 53	2915	95 12 47	2922
	α Aquilæ W.	44 16 30	2267	45 23 53	2211	46 32 9	2159	47 41 14	2112
4	SUN E.	65 18 56	2280	63 56 17	2268	62 33 47	2267	61 11 27	2265
	Antares W.	102 40 19	2950	104 9 30	2955	105 38 35	2960	107 7 34	2963
	α Aquilæ W.	53 36 51	2920	54 49 40	2904	56 2 56	2878	57 16 37	2856
5	Fomalhaut W.	31 20 30	2211	32 14 43	2240	33 11 7	2269	34 9 31	2294
	SUN E.	54 21 51	2426	53 0 18	2444	51 38 51	2445	50 17 29	2444
	α Aquilæ W.	63 30 24	2764	64 46 4	2748	66 2 0	2734	67 18 11	2722
6	Fomalhaut W.	39 26 2	2373	40 33 20	2304	41 41 42	2143	42 51 3	2086
	SUN E.	43 31 57	2474	42 11 4	2477	40 50 14	2480	39 29 27	2483
	α Aquilæ W.	73 42 13	2908	74 59 34	2900	76 17 4	2881	77 34 43	2864
7	Fomalhaut W.	48 50 10	2926	50 4 4	2933	51 18 32	2902	52 33 32	2873
	SUN E.	32 46 21	2496	31 25 52	2498	30 5 26	2502	28 45 4	2506
	α Aquilæ W.	84 4 48	2613	85 23 8	2609	86 41 33	2605	88 0 2	2600
11	Fomalhaut W.	58 55 28	2656	60 13 3	2635	61 30 59	2617	62 49 15	2600
	SUN E.	22 4 18	2681	20 44 28	2640	19 24 48	2643	18 5 21	2647
	SUN W.	22 50 22	2245	24 13 41	2229	25 37 19	2214	27 1 14	2201
12	Pollux E.	37 28 40	2014	35 58 44	2014	34 28 48	2015	32 58 54	2018
	Jupiter E.	64 20 14	2958	62 49 8	2950	61 17 53	2943	59 46 29	2937
	Regulus E.	73 59 27	2926	72 27 41	2920	70 55 47	2913	69 23 44	2906
13	Saturn E.	78 44 12	2943	77 12 46	2936	75 41 11	2927	74 9 27	2920
	SUN W.	34 4 30	2241	35 29 51	2229	36 55 26	2216	38 21 14	2206
	Pollux E.	25 30 55	2080	24 1 56	2078	22 33 19	2100	21 5 9	2128
14	Jupiter E.	52 7 18	2901	50 35 0	2894	49 2 33	2886	47 29 56	2878
	Regulus E.	61 41 8	2908	60 8 8	2899	58 34 57	2892	57 1 36	2884
	Saturn E.	66 28 35	2926	64 55 57	2917	63 23 9	2909	61 50 11	2902
15	SUN W.	45 33 38	2160	47 0 47	2138	48 28 10	2127	49 55 47	2115
	Jupiter E.	39 44 23	2929	38 10 46	2931	36 36 59	2924	35 3 2	2917
	Regulus E.	49 12 13	2902	47 37 48	2793	46 3 11	2785	44 28 23	2776
16	Saturn E.	54 2 52	2922	52 28 53	2913	50 54 44	2906	49 20 24	2798
	Spica E.	103 13 30	2789	101 38 48	2780	100 3 54	2770	98 26 47	2761
	SUN W.	57 17 26	2046	58 46 30	2043	60 15 50	2030	61 45 25	2018
17	Mars W.	24 6 13	2927	25 37 58	2916	27 9 58	2908	28 42 13	2901
	Jupiter E.	27 11 5	2755	25 36 18	2781	24 1 25	2776	22 26 26	2773
	Regulus E.	36 31 37	2734	34 55 42	2726	33 19 35	2716	31 43 17	2708
18	Saturn E.	41 26 10	2759	39 50 48	2752	38 15 17	2744	36 39 36	2738
	Spica E.	90 29 56	2708	88 53 27	2698	87 16 44	2697	85 39 46	2675

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
15	SUN	W.	63° 15' 16"	3006	64° 45' 23"	3002	66° 15' 46"	3078	67° 46' 26"	3065
	Mars	W.	30 14 44	3079	31 47 30	3006	33 20 32	3054	34 53 50	3043
	Regulus	E.	30 6 49	3701	28 30 11	3006	26 53 24	3089	25 16 29	3084
	Saturn	E.	35 3 46	3783	33 27 48	3736	31 51 43	3723	30 15 32	3716
	Spica	E.	84 2 33	3064	82 25 5	3062	80 47 21	3040	79 9 21	3038
16	SUN	W.	75 23 58	3097	76 56 21	3093	78 29 2	3069	80 2 1	3064
	Mars	W.	42 44 30	3776	44 19 29	3702	45 54 47	3748	47 30 23	3735
	Pollux	W.	21 33 6	3013	23 7 17	3706	24 42 27	3729	26 18 29	3084
	Spica	E.	70 55 10	3068	69 15 29	3063	67 35 30	3041	65 55 14	3038
17	SUN	W.	87 51 39	3781	89 26 32	3766	91 1 45	3761	92 37 17	3786
	Mars	W.	55 33 2	3063	57 10 31	3049	58 48 19	3036	60 26 27	3030
	Pollux	W.	34 29 1	3060	36 8 52	3037	37 49 14	3016	39 30 5	3006
	Spica	E.	57 29 22	3402	55 47 16	3449	54 4 51	3436	52 22 7	3423
	Antares	E.	103 7 52	3446	101 25 35	3441	99 42 59	3427	98 0 3	3413
18	SUN	W.	100 39 56	3092	102 17 27	3046	103 55 19	3032	105 33 31	3018
	Mars	W.	68 42 4	3048	70 22 11	3038	72 2 38	3018	73 43 26	3004
	Pollux	W.	48 1 6	3406	49 44 34	3367	51 28 27	3371	53 12 43	3356
	Jupiter	W.	19 57 47	3406	21 40 2	3431	23 22 52	3408	25 6 15	3387
	Spica	E.	43 43 38	3066	41 59 0	3043	40 14 3	3031	38 28 48	3018
19	SUN	W.	113 49 20	3048	115 29 27	3036	117 9 52	3021	118 50 36	3008
	Mars	W.	82 12 18	3436	83 55 3	3423	85 38 6	3409	87 21 28	3396
	Pollux	W.	61 59 42	3090	63 46 11	3206	65 38 1	3202	67 20 11	3200
	Jupiter	W.	33 50 15	3096	35 36 17	3203	37 22 42	3066	39 9 28	3064
	Regulus	W.	24 58 2	3091	26 44 14	3073	28 30 53	3056	30 17 59	3036
20	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
21	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
22	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
23	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
24	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
25	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
26	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
27	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
28	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
29	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
30	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
31	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
32	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
33	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
34	SUN	W.	127 18 33	3050	129 0 56	3040	130 43 34	3030	132 26 26	3021
	Mars	W.	96 2 42	3037	97 47 47	3037	99 33 7	3017	101 18 42	3007
	Pollux	W.	76 20 42	3179	78 9 41	3109	79 58 56	3169	81 48 26	3149
	Jupiter	W.	48 8 15	3192	49 56 55	3100	51 45 52	3170	53 35 5	3160
	Regulus	W.	39 19 15	3106	41 8 31	3166	42 58 5	3146	44 47 56	3124
35	SUN	W.	34 39 17	3014	36 27 23	3109	38 15 52	3164	40 4 43	3173
	Saturn	W.	20 33 9	3008	22 16 33	3073	24 0 47	3043	25 45 45	3016
	Spica	E.	29 38 14	3062	27 51 19	3063	26 4 11	3045	24 16 51	3036
	Antares	E.	75 11 50	3037	73 24 18	3036	71 36 27	3012	69 48 18	3000
	α Aquilæ	E.	112 27 48	3774	110 52 46	3746	109 17 10	3726	107 41 3	3704
36	SUN									

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	SUN W.	69° 17' 23"	2803	70° 48' 35"	2808	72° 20' 5"	2824	73° 51' 53"	2811
	Mars W.	36 27 24	2828	38 1 15	2815	39 35 23	2809	41 9 48	2789
	Regulus E.	23 39 27	2861	22 2 21	2879	20 25 13	2881	18 48 7	2888
	Saturn E.	28 39 16	2716	27 2 57	2716	25 26 38	2717	23 50 21	2722
	Spica E.	77 31 4	2616	75 52 31	2604	74 13 41	2691	72 34 34	2579
16	SUN W.	81 35 19	2830	83 8 56	2826	84 42 51	2811	86 17 5	2795
	Mars W.	49 6 17	2720	50 42 30	2706	52 19 2	2692	53 55 52	2678
	Pollux W.	27 55 17	2692	29 32 48	2684	31 10 57	2607	32 49 42	2683
	Spica E.	64 14 40	2515	62 33 48	2503	60 52 38	2489	59 11 9	2476
17	SUN W.	94 13 9	2721	95 49 21	2706	97 25 53	2691	99 2 45	2677
	Mars W.	62 4 55	2605	63 43 43	2591	65 22 50	2577	67 2 17	2562
	Pollux W.	41 11 24	2477	42 53 10	2468	44 35 23	2439	46 18 2	2422
	Spica E.	50 39 4	2408	48 55 41	2395	47 11 59	2382	45 27 58	2368
	Antares E.	96 16 47	2209	94 33 11	2195	92 49 15	2173	91 5 0	2168
18	SUN W.	107 12 2	2608	108 50 53	2599	110 30 3	2575	112 9 32	2561
	Mars W.	75 24 33	2430	77 6 0	2476	78 47 47	2403	80 29 53	2449
	Pollux W.	54 57 22	2339	56 42 24	2324	58 27 48	2309	60 13 34	2294
	Jupiter W.	26 50 9	2208	28 34 32	2148	30 19 21	2131	32 4 36	2114
	Spica E.	36 43 15	2206	34 57 24	2195	33 11 17	2184	31 24 54	2172
19	Antares E.	82 18 45	2290	80 32 31	2277	78 45 57	2263	76 59 3	2250
	SUN W.	120 31 38	2430	122 12 57	2484	123 54 33	2473	125 36 25	2461
	Mars W.	89 5 8	2384	90 49 6	2373	92 33 21	2360	94 17 53	2348
	Pollux W.	69 7 40	2327	70 55 28	2314	72 43 35	2302	74 32 0	2190
	Jupiter W.	40 56 35	2241	42 44 2	2228	44 31 48	2215	46 19 53	2204
20	Regulus W.	32 5 30	2222	33 53 25	2208	35 41 41	2194	37 30 18	2180
	Saturn W.	27 31 23	2291	29 17 36	2269	31 4 21	2249	32 51 36	2231
	Spica E.	22 29 20	2223	20 41 42	2230	18 53 59	2230	17 6 16	2223
	Antares E.	67 59 51	2188	66 11 6	2177	64 22 4	2166	62 32 45	2155
	SUN W.	134 9 31	2412	135 52 48	2404	137 36 17	2397	139 19 56	2390
21	Mars W.	103 4 32	2298	104 50 35	2289	106 36 51	2281	108 23 19	2273
	Pollux W.	83 38 11	2129	85 28 10	2121	87 18 22	2123	89 8 46	2116
	Jupiter W.	55 24 33	2161	57 14 15	2141	59 4 11	2133	60 54 20	2125
	Regulus W.	46 38 4	2124	48 28 27	2116	50 19 4	2106	52 9 55	2098
	Saturn W.	41 53 53	2169	43 43 22	2148	45 33 8	2137	47 23 10	2128
22	Antares E.	53 22 13	2106	51 31 23	2099	49 40 21	2091	47 49 8	2084
	α Aquilæ E.	106 4 28	2084	104 27 26	2086	102 50 0	2049	101 12 12	2035
	Mars W.	117 18 12	2243	119 5 35	2239	120 53 5	2225	122 40 40	2222
	Pollux W.	98 23 15	2098	100 14 32	2085	102 5 55	2081	103 57 23	2080
	Jupiter W.	70 7 42	2096	71 58 48	2091	73 50 1	2088	75 41 19	2085
23	Regulus W.	61 26 58	2096	63 18 50	2081	65 10 49	2087	67 2 54	2085
	Saturn W.	56 36 36	2091	58 27 49	2086	60 19 10	2092	62 10 37	2078
	Antares E.	38 30 33	2066	36 38 26	2053	34 46 14	2050	32 53 57	2047
	α Aquilæ E.	92 59 1	2086	91 19 47	2082	89 40 27	2078	88 1 2	2077
	Jupiter W.	84 58 32	2061	86 50 0	2063	88 41 25	2065	90 32 47	2068
24	Regulus W.	76 24 5	2060	78 16 22	2043	80 8 36	2043	82 0 47	2056
	Saturn W.	71 28 52	2072	73 20 35	2073	75 12 16	2075	77 3 54	2077
	Spica W.	22 24 17	2079	24 15 48	2076	26 7 26	2072	27 59 8	2072
	Antares E.	23 32 6	2049	21 39 48	2053	19 47 36	2097	17 55 30	2092

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
22	α Aquilæ E.	86° 21' 35"	2877	84° 42' 9"	2879	83° 2' 45"	2883	81° 23' 26"	2888
23	Jupiter W.	92 24 5	2903	94 15 17	2906	96 6 22	2101	97 57 19	2107
	Regulus W.	83 52 54	2909	85 44 56	2903	87 36 52	2908	89 28 40	2973
	Saturn W.	78 55 28	2981	80 46 57	2985	82 38 20	2989	84 29 36	2994
	Spica W.	29 50 51	2973	31 42 33	2973	33 34 13	2977	35 25 48	2980
	α Aquilæ E.	73 9 34	2843	71 31 38	2860	69 54 5	2880	68 16 58	2761
	Fomalhaut E.	97 58 16	2476	96 16 32	2480	94 34 51	2483	92 53 14	2487
24	Jupiter W.	107 9 35	2146	108 59 25	2155	110 49 0	2166	112 38 19	2177
	Regulus W.	98 45 14	2111	100 35 56	2120	102 26 24	2131	104 16 36	2141
	Saturn W.	93 43 32	2123	95 33 42	2141	97 23 38	2152	99 13 18	2163
	Spica W.	44 41 49	2113	46 32 29	2121	48 22 56	2130	50 13 9	2140
	α Aquilæ E.	60 19 48	2862	58 46 27	2891	57 13 57	2923	55 42 22	2981
	Fomalhaut E.	84 27 14	2829	82 46 41	2843	81 6 27	2857	79 26 33	2873
	α Pegasi E.	105 5 56	2253	103 18 48	2260	101 31 49	2268	99 45 2	2277
25	Spica W.	59 20 6	2200	61 8 34	2213	62 56 42	2227	64 44 29	2242
	Antares W.	13 40 13	2211	15 28 24	2223	17 16 17	2236	19 3 51	2249
	α Aquilæ E.	48 20 59	2204	46 56 40	2276	45 33 56	2406	44 12 54	2465
	Fomalhaut E.	71 13 11	2978	60 35 58	2701	67 59 19	2728	66 23 16	2757
	α Pegasi E.	90 54 53	2235	89 9 44	2248	87 24 55	2263	85 40 27	2278
26	Spica W.	73 37 49	2220	75 23 20	2236	77 8 27	2243	78 53 9	2271
	Antares W.	27 56 50	2219	29 42 22	2235	31 27 30	2243	33 12 14	2266
	Fomalhaut E.	58 33 22	2981	57 1 43	2973	55 30 57	2918	54 1 7	2967
	α Pegasi E.	77 3 56	2465	75 21 54	2485	73 40 19	2504	71 59 12	2524
27	Spica W.	87 30 21	2480	89 12 31	2477	90 54 16	2496	92 35 35	2514
	Antares W.	41 49 44	2456	43 31 59	2475	45 13 48	2493	46 55 12	2510
	Fomalhaut E.	46 47 54	2862	45 24 54	2436	44 3 17	2518	42 43 9	2601
	α Pegasi E.	63 40 51	2635	62 2 44	2650	60 25 9	2664	58 48 7	2706
	α Arietis E.	105 58 49	2473	104 16 57	2490	102 35 30	2507	100 54 27	2525
	SUN E.	136 42 44	2788	135 7 56	2803	133 33 32	2823	131 59 33	2841
28	Antares W.	55 15 56	2600	56 54 51	2618	58 33 21	2636	60 11 27	2654
	Fomalhaut E.	36 28 33	4178	35 19 46	4333	34 13 24	4506	33 9 37	4680
	α Pegasi E.	50 51 38	2847	49 18 11	2877	47 45 23	2909	46 13 15	2942
	α Arietis E.	92 35 29	2616	90 56 56	2634	89 18 47	2662	87 41 2	2690
	SUN E.	124 15 41	2826	122 44 8	2841	121 12 58	2873	119 42 12	2902
29	Antares W.	68 16 7	2738	69 51 56	2755	71 27 23	2771	73 2 29	2786
	α Pegasi E.	38 43 41	3136	37 16 14	3182	35 49 43	3231	34 24 11	3286
	α Arietis E.	79 38 8	2755	78 2 41	2771	76 27 35	2788	74 52 51	2804
	SUN E.	112 14 5	2982	110 45 34	3100	109 17 24	3117	107 49 35	3133
30	Antares W.	80 53 2	2880	82 26 12	2873	83 59 5	2887	85 31 41	2906
	α Aquilæ W.	37 18 2	4784	38 18 33	4619	39 20 41	4518	40 24 17	4438
	α Arietis E.	67 4 16	2879	65 31 30	2884	63 59 3	2907	62 26 53	2926
	SUN E.	100 35 26	3212	99 9 31	3227	97 43 54	3242	96 18 34	3256
31	Antares W.	93 10 45	2958	94 41 51	2980	96 12 43	2978	97 43 23	2987
	α Aquilæ W.	45 59 49	4109	47 9 42	4063	48 20 20	4023	49 31 38	3985
	α Arietis E.	54 50 11	2983	53 19 37	2994	51 49 17	3006	50 19 11	3016
	SUN E.	89 15 48	3318	87 51 57	3326	86 28 19	3336	85 4 53	3350

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	α Aquilæ E.	79° 44' 15"	2596	78° 5' 14"	2604	76° 26' 25"	2616	74° 47' 51"	2626
23	Jupiter W.	99 48 8	2113	101 38 47	2120	103 29 15	2128	105 19 31	2136
	Regulus W.	91 20 20	2090	93 11 50	2096	95 3 10	2094	96 54 18	2102
	Saturn W.	86 20 45	2100	88 11 44	2107	90 2 32	2116	91 53 8	2123
	Spica W.	37 17 18	2065	39 8 41	2091	40 59 54	2098	42 50 57	2106
	α Aquilæ E.	66 40 20	2726	65 4 15	2753	63 28 45	2783	61 53 55	2816
	Fomalhaut E.	91 11 42	2492	89 30 18	2499	87 49 4	2506	86 8 2	2518
24	Jupiter W.	114 27 21	2188	116 16 6	2201	118 4 32	2214	119 52 39	2226
	Regulus W.	106 6 32	2153	107 56 11	2166	109 45 31	2178	111 34 32	2191
	Saturn W.	101 2 41	2174	102 51 47	2186	104 40 35	2199	106 29 4	2213
	Spica W.	52 3 7	2151	53 52 48	2163	55 42 12	2174	57 31 18	2186
	α Aquilæ E.	54 11 46	2033	52 42 14	2090	51 13 52	2169	49 46 45	2220
	Fomalhaut E.	77 47 1	2590	76 7 52	2610	74 29 10	2630	72 50 56	2652
	α Pegasi E.	97 58 29	2267	96 12 10	2296	94 26 7	2309	92 40 21	2322
25	Spica W.	66 31 54	2267	68 18 57	2272	70 5 37	2287	71 51 55	2304
	Antares W.	20 51 6	2262	22 38 2	2274	24 24 39	2289	26 10 55	2303
	α Aquilæ E.	42 53 42	2675	41 36 28	2796	40 21 22	2830	39 8 33	2879
	Fomalhaut E.	64 47 52	2783	63 13 8	2821	61 39 7	2856	60 5 51	2892
	α Pegasi E.	83 56 21	2394	82 12 38	2411	80 29 19	2429	78 46 25	2446
26	Spica W.	80 37 26	2388	82 21 18	2406	84 4 44	2424	85 47 45	2441
	Antares W.	34 56 34	2386	36 40 29	2403	38 23 59	2421	40 7 4	2438
	Fomalhaut E.	52 32 17	2118	51 4 29	2172	49 37 46	2221	48 12 13	2294
	α Pegasi E.	70 18 32	2545	68 38 21	2606	66 58 40	2669	65 19 30	2612
27	Spica W.	94 16 29	2533	95 56 57	2551	97 37 0	2569	99 16 38	2587
	Antares W.	48 36 11	2529	50 16 44	2546	51 56 53	2564	53 36 37	2583
	Fomalhaut E.	41 24 36	2695	40 7 44	2799	38 52 41	2813	37 39 34	2839
	α Pegasi E.	57 11 38	2735	55 35 44	2781	54 0 25	2789	52 25 43	2818
	α Arietis E.	99 13 49	2643	97 33 36	2662	95 53 49	2680	94 14 27	2698
	SUN E.	130 25 58	2669	128 52 47	2679	127 20 1	2698	125 47 39	2616
28	Antares W.	61 49 9	2671	63 26 28	2688	65 3 24	2706	66 39 57	2722
	Fomalhaut E.	32 8 37	4917	31 10 36	5166	30 15 48	5449	29 24 28	5780
	α Pegasi E.	44 41 49	2977	43 11 7	3013	41 41 10	3051	40 12 0	3092
	α Arietis E.	86 3 40	2687	84 26 42	2704	82 50 8	2723	81 13 57	2738
	SUN E.	118 11 49	3010	116 41 49	3029	115 12 12	3047	113 42 58	3065
29	Antares W.	74 37 15	2801	76 11 41	2817	77 45 47	2831	79 19 34	2846
	α Pegasi E.	32 59 43	2347	31 36 26	2414	30 14 25	2498	28 53 47	2569
	α Arietis E.	73 18 28	2619	71 44 25	2636	70 10 43	2660	68 37 20	2685
	SUN E.	106 22 6	3160	104 54 57	3167	103 28 8	3183	102 1 38	3198
30	Antares W.	87 4 0	2912	88 36 3	2924	90 7 51	2935	91 39 25	2946
	α Aquilæ W.	41 29 13	4249	42 35 21	4278	43 42 34	4316	44 50 45	4360
	α Arietis E.	60 55 0	2934	59 23 24	2946	57 52 4	2969	56 21 0	2971
	SUN E.	94 53 31	3200	93 28 43	3262	92 4 10	3294	90 39 52	3306
31	Antares W.	99 13 52	2997	100 44 9	3006	102 14 15	3013	103 44 12	3021
	α Aquilæ W.	50 43 32	2951	51 56 0	2921	53 8 58	2894	54 22 24	2869
	α Arietis E.	48 49 18	2926	47 19 38	2907	45 50 11	2947	44 20 56	2956
	SUN E.	83 41 39	3369	82 18 36	3369	80 55 44	3378	79 33 2	3386

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.											
Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from		Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	added to Apparent Time.				
Sat.	1	^h 4 ^m 37 ^s 18.27	10.232	N.22° 5' 49".3	20.18	15' 48".23	68.42	^m 2 ^s 29.97	^s 0.375		
Sun.	2	4 41 24.07	10.249	22 13 42.2	19.22	15 48.09	68.48	2 20.74	0.393		
Mon.	3	4 45 30.28	10.266	22 21 11.9	18.25	15 47.96	68.53	2 11.12	0.409		
Tues.	4	4 49 36.87	10.281	22 28 18.1	17.27	15 47.83	68.58	2 1.11	0.423		
Wed.	5	4 53 43.81	10.295	22 35 0.9	16.29	15 47.71	68.63	1 50.76	0.437		
Thur.	6	4 57 51.10	10.309	22 41 20.0	15.30	15 47.60	68.67	1 40.05	0.451		
Fri.	7	5 1 58.71	10.322	22 47 15.3	14.30	15 47.49	68.71	1 29.03	0.465		
Sat.	8	5 6 6.62	10.334	22 52 46.5	13.29	15 47.38	68.75	1 17.71	0.477		
Sun.	9	5 10 14.80	10.344	22 57 53.6	12.28	15 47.27	68.79	1 6.13	0.487		
Mon.	10	5 14 23.21	10.353	23 2 36.4	11.27	15 47.18	68.82	0 54.31	0.496		
Tues.	11	5 18 31.83	10.362	23 6 54.9	10.26	15 47.09	68.85	0 42.28	0.504		
Wed.	12	5 22 40.65	10.369	23 10 48.9	9.24	15 47.00	68.88	0 30.04	0.511		
Thur.	13	5 26 49.64	10.376	23 14 18.5	8.22	15 46.92	68.90	0 17.64	0.517		
Fri.	14	5 30 58.78	10.382	23 17 23.6	7.20	15 46.84	68.92	0 5.10	0.521		
Sat.	15	5 35 8.05	10.387	23 20 4.1	6.17	15 46.77	68.94	0 7.57	0.525		
Sun.	16	5 39 17.42	10.390	23 22 19.8	5.14	15 46.71	68.95	0 20.34	0.529		
Mon.	17	5 43 26.86	10.392	23 24 10.8	4.11	15 46.65	68.96	0 33.19	0.532		
Tues.	18	5 47 36.33	10.394	23 25 37.1	3.08	15 46.59	68.97	0 46.06	0.535		
Wed.	19	5 51 45.82	10.394	23 26 38.7	2.05	15 46.53	68.98	0 58.96	0.537		
Thur.	20	5 55 55.31	10.394	23 27 15.5	1.02	15 46.48	68.98	1 11.86	0.536		
Fri.	21	6 0 4.80	10.394	23 27 27.5	0.02	15 46.43	68.98	1 24.75	0.535		
Sat.	22	6 4 14.27	10.392	23 27 14.7	1.05	15 46.38	68.97	1 37.63	0.533		
Sun.	23	6 8 23.69	10.389	23 26 37.1	2.08	15 46.34	68.96	1 50.46	0.531		
Mon.	24	6 12 33.03	10.386	23 25 34.8	3.11	15 46.30	68.95	2 3.22	0.529		
Tues.	25	6 16 42.28	10.381	23 24 7.8	4.14	15 46.27	68.93	2 15.87	0.526		
Wed.	26	6 20 51.42	10.376	23 22 16.2	5.17	15 46.24	68.91	2 28.41	0.522		
Thur.	27	6 25 0.43	10.371	23 19 59.8	6.19	15 46.21	68.89	2 40.82	0.516		
Fri.	28	6 29 9.29	10.364	23 17 18.9	7.21	15 46.18	68.87	2 53.11	0.509		
Sat.	29	6 33 17.98	10.357	23 14 13.4	8.24	15 46.16	68.84	3 5.21	0.500		
Sun.	30	6 37 26.48	10.348	23 10 43.3	9.26	15 46.15	68.81	3 17.11	0.491		
Mon.	31	6 41 34.76	10.338	N.23 6 48.9	10.27	15 46.14	68.78	3 28.80	0.481		

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Equation of Time, to be added to		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	subtracted from Mean Time.				
						^m ^s	^s			
Sat.	1	^h 4 ^m 37 ^s 18.70	10.232	N.22° 5' 50.1"	20.18	^m 2 ^s 29.95	0.375	^h 4 ^m 39 ^s 48.65		
Sun.	2	4 41 24.48	10.249	22 13 42.9	19.22	2 20.72	0.393	4 43 45.20		
Mon.	3	4 45 30.66	10.266	22 21 12.5	18.25	2 11.10	0.409	4 47 41.76		
Tues.	4	4 49 37.22	10.281	22 28 18.7	17.27	2 1.10	0.423	4 51 38.32		
Wed.	5	4 53 44.13	10.295	22 35 1.4	16.29	1 50.75	0.437	4 55 34.88		
Thur.	6	4 57 51.89	10.309	22 41 20.4	15.30	1 40.04	0.451	4 59 31.43		
Fri.	7	5 1 58.97	10.322	22 47 15.6	14.30	1 29.02	0.465	5 3 27.99		
Sat.	8	5 6 6.85	10.334	22 52 46.7	13.29	1 17.70	0.477	5 7 24.55		
Sun.	9	5 10 14.99	10.344	22 57 53.7	12.28	1 6.12	0.487	5 11 21.11		
Mon.	10	5 14 23.37	10.353	23 2 36.5	11.27	0 54.30	0.496	5 15 17.67		
Tues.	11	5 18 31.96	10.362	23 6 54.9	10.26	0 42.27	0.504	5 19 14.23		
Wed.	12	5 22 40.75	10.369	23 10 48.9	9.24	0 30.03	0.511	5 23 10.78		
Thur.	13	5 26 49.70	10.376	23 14 18.5	8.22	0 17.64	0.517	5 27 7.34		
Fri.	14	5 30 58.80	10.382	23 17 23.6	7.20	0 5.10	0.521	5 31 3.90		
Sat.	15	5 35 8.03	10.387	23 20 4.1	6.17	0 7.57	0.525	5 35 0.46		
Sun.	16	5 39 17.36	10.390	23 22 19.8	5.14	0 20.34	0.529	5 38 57.02		
Mon.	17	5 43 26.76	10.392	23 24 10.8	4.11	0 33.19	0.532	5 42 53.57		
Tues.	18	5 47 36.19	10.394	23 25 37.1	3.08	0 46.06	0.535	5 46 50.13		
Wed.	19	5 51 45.65	10.394	23 26 38.7	2.05	0 58.96	0.537	5 50 46.69		
Thur.	20	5 55 55.10	10.394	23 27 15.5	1.02	1 11.85	0.536	5 54 43.25		
Fri.	21	6 0 4.55	10.394	23 27 27.5	0.00	1 24.74	0.535	5 58 39.81		
Sat.	22	6 4 13.99	10.392	23 27 14.7	1.04	1 37.63	0.533	6 2 36.36		
Sun.	23	6 8 23.37	10.389	23 26 37.2	2.08	1 50.45	0.531	6 6 32.92		
Mon.	24	6 12 32.68	10.386	23 25 34.9	3.11	2 3.20	0.529	6 10 29.48		
Tues.	25	6 16 41.89	10.381	23 24 7.9	4.14	2 15.85	0.526	6 14 26.04		
Wed.	26	6 20 50.99	10.376	23 22 16.3	5.17	2 28.39	0.522	6 18 22.60		
Thur.	27	6 24 59.96	10.371	23 20 0.0	6.19	2 40.80	0.516	6 22 19.16		
Fri.	28	6 29 8.79	10.364	23 17 19.2	7.21	2 53.08	0.509	6 26 15.71		
Sat.	29	6 33 17.45	10.357	23 14 13.8	8.24	3 5.18	0.500	6 30 12.27		
Sun.	30	6 37 25.91	10.348	23 10 43.8	9.26	3 17.08	0.491	6 34 8.83		
Mon.	31	6 41 34.16	10.338	N.23 6 49.5	10.27	3 28.77	0.481	6 38 5.39		

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.											
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.		
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.						
		λ	λ'								
1	152	70° 54' 47.9	54' 11.2	143.64	+0.79	0.0062637	26.5	19 17 1.28			
2	153	71 52 14.7	51 37.8	143.61	0.84	.0063263	25.7	19 13 5.37			
3	154	72 49 41.0	49 3.9	143.58	0.86	.0063871	24.9	19 9 9.45			
4	155	73 47 6.6	46 29.4	143.55	0.84	.0064459	24.0	19 5 13.54			
5	156	74 44 31.5	43 54.2	143.42	0.80	.0065022	22.9	19 1 17.63			
6	157	75 41 55.6	41 18.1	143.49	0.73	.0065561	21.9	18 57 21.72			
7	158	76 39 18.9	38 41.2	143.46	0.64	.0066075	20.9	18 53 25.81			
8	159	77 36 41.5	36 3.6	143.43	0.53	.0066565	19.8	18 49 29.89			
9	160	78 34 3.3	33 25.2	143.39	0.40	.0067030	18.8	18 45 33.98			
10	161	79 31 24.4	30 46.2	143.35	0.27	.0067470	17.8	18 41 38.07			
11	162	80 28 44.6	28 6.2	143.31	0.14	.0067885	16.8	18 37 42.16			
12	163	81 26 4.0	25 25.4	143.27	+0.01	.0068276	15.8	18 33 46.25			
13	164	82 23 22.6	22 43.8	143.23	-0.10	.0068643	14.8	18 29 50.33			
14	165	83 20 40.3	20 1.3	143.20	0.19	.0068988	13.9	18 25 54.42			
15	166	84 17 57.2	17 18.1	143.17	0.25	.0069312	13.1	18 21 58.51			
16	167	85 15 13.2	14 33.9	143.14	0.27	.0069616	12.3	18 18 2.60			
17	168	86 12 28.4	11 48.9	143.11	0.27	.0069902	11.6	18 14 6.69			
18	169	87 9 42.8	9 3.1	143.08	0.24	.0070171	10.9	18 10 10.77			
19	170	88 6 56.6	6 16.7	143.06	0.18	.0070424	10.2	18 6 14.86			
20	171	89 4 9.9	3 29.8	143.04	-0.09	.0070661	9.5	18 2 18.95			
21	172	90 1 22.6	0 42.3	143.02	+0.02	.0070883	8.9	17 58 23.04			
22	173	90 58 34.9	57 54.4	143.00	0.14	.0071091	8.3	17 54 27.13			
23	174	91 55 46.9	55 6.2	142.99	0.27	.0071284	7.7	17 50 31.21			
24	175	92 52 58.5	52 17.6	142.98	0.41	.0071463	7.2	17 46 35.30			
25	176	93 50 9.9	49 28.8	142.98	0.55	.0071627	6.6	17 42 39.39			
26	177	94 47 21.3	46 40.0	142.98	0.66	.0071776	5.9	17 38 43.48			
27	178	95 44 32.7	43 51.2	142.98	0.76	.0071909	5.2	17 34 47.57			
28	179	96 41 44.2	41 2.5	142.99	0.85	.0072024	4.5	17 30 51.65			
29	180	97 38 55.9	38 14.1	143.00	0.90	.0072122	3.7	17 26 55.74			
30	181	98 36 7.8	35 25.8	143.00	0.91	.0072201	2.9	17 22 59.83			
31	182	99 33 19.8	32 37.6	143.01	+0.90	0.0072258	2.0	17 19 3.92			

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
								Diff. for 1 hour.	
1	14' 53.3	14' 50.5	54' 31.7	-0.95	54' 21.5	-0.74	^h ^m 19 17.7	^m 1.69	^d 22.5
2	14 48.4	14 47.0	54 13.8	0.54	54 8.5	-0.34	19 58.6	1.73	23.5
3	14 46.2	14 46.0	54 5.7	-0.15	54 5.0	+0.03	20 40.8	1.80	24.5
4	14 46.4	14 47.3	54 6.4	+0.30	54 9.8	0.36	21 25.3	1.90	25.5
5	14 48.8	14 50.7	54 15.1	0.51	54 22.1	0.65	22 12.3	2.02	26.5
6	14 53.0	14 55.7	54 30.8	0.77	54 40.6	0.86	23 2.1	2.13	27.5
7	14 58.7	15 1.9	54 51.4	0.94	55 3.3	1.02	23 54.1	2.20	28.5
8	15 5.3	15 9.0	55 15.9	1.08	55 29.2	1.14	δ		29.5
9	15 12.8	15 16.7	55 43.2	1.18	55 57.5	1.22	0 47.3	2.22	0.9
10	15 20.7	15 24.8	56 12.3	1.24	56 27.3	1.26	1 40.4	2.20	1.9
11	15 28.9	15 33.1	56 42.6	1.28	56 58.1	1.30	2 32.4	2.14	2.9
12	15 37.4	15 41.7	57 13.8	1.31	57 29.5	1.31	3 22.7	2.06	3.9
13	15 46.0	15 50.3	57 45.2	1.31	58 0.9	1.31	4 11.5	2.01	4.9
14	15 54.5	15 58.7	58 16.5	1.29	58 31.9	1.27	4 59.4	1.99	5.9
15	16 2.8	16 6.7	58 46.9	1.23	59 1.3	1.17	5 47.3	2.01	6.9
16	16 10.4	16 13.8	59 14.9	1.09	59 27.4	1.00	6 36.3	2.08	7.9
17	16 16.9	16 19.5	59 38.6	0.87	59 48.2	0.72	7 27.7	2.21	8.9
18	16 21.5	16 22.9	59 55.7	0.53	60 0.8	+0.32	8 22.6	2.36	9.9
19	16 23.6	16 23.5	60 3.4	+0.10	60 3.1	-0.14	9 21.1	2.50	10.9
20	16 22.6	16 20.9	59 59.9	-0.40	59 53.4	0.67	10 22.4	2.59	11.9
21	16 18.3	16 14.9	59 43.9	0.92	59 31.4	1.16	11 24.9	2.59	12.9
22	16 10.7	16 5.9	59 16.1	1.39	58 58.3	1.58	12 25.9	2.48	13.9
23	16 0.5	15 54.6	58 38.3	1.74	58 16.7	1.87	13 23.3	2.30	14.9
24	15 48.3	15 41.9	57 53.8	1.95	57 30.1	1.99	14 16.2	2.11	15.9
25	15 35.4	15 29.0	57 6.2	1.99	56 42.6	1.95	15 4.8	1.95	16.9
26	15 22.7	15 16.7	56 19.6	1.87	55 57.8	1.77	15 49.8	1.82	17.9
27	15 11.2	15 6.1	55 37.3	1.63	55 18.7	1.48	16 32.4	1.74	18.9
28	15 1.6	14 57.6	55 2.0	1.30	54 47.6	1.11	17 13.6	1.71	19.9
29	14 54.8	14 51.7	54 35.5	0.90	54 25.9	0.69	17 54.6	1.72	20.9
30	14 49.8	14 48.6	54 18.9	0.48	54 14.5	-0.26	18 36.5	1.78	21.9
31	14 48.1	14 48.3	54 12.6	-0.05	54 13.2	+0.16	19 20.0	1.85	22.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 1.					MONDAY 3.				
0	23 25 48.62	1.8066	N. 1° 34' 54.4"	12.716	0	0 53 1.00	1.8622	N. 11° 18' 53.8"	11.375
1	23 27 36.95	1.8061	1 47 37.0	12.703	1	0 54 52.21	1.8548	11 30 15.0	11.331
2	23 29 25.24	1.8046	2 0 18.8	12.689	2	0 56 43.58	1.8474	11 41 33.5	11.287
3	23 31 13.51	1.8043	2 12 59.7	12.674	3	0 58 35.10	1.8399	11 52 49.4	11.243
4	23 33 1.76	1.8040	2 25 39.7	12.659	4	1 0 26.77	1.8325	12 4 2.5	11.198
5	23 34 49.99	1.8037	2 38 18.8	12.643	5	1 2 18.60	1.8252	12 15 12.8	11.148
6	23 36 38.20	1.8034	2 50 56.9	12.627	6	1 4 10.60	1.8180	12 26 20.3	11.101
7	23 38 26.40	1.8031	3 3 34.0	12.610	7	1 6 2.76	1.8107	12 37 24.9	11.053
8	23 40 14.58	1.8030	3 16 10.1	12.592	8	1 7 55.09	1.8038	12 48 26.7	11.005
9	23 42 2.76	1.8030	3 28 45.1	12.574	9	1 9 47.53	1.7965	12 59 25.5	10.946
10	23 43 50.95	1.8031	3 41 19.0	12.556	10	1 11 40.27	1.7896	13 10 21.3	10.904
11	23 45 39.14	1.8032	3 53 51.7	12.538	11	1 13 33.13	1.7824	13 21 14.0	10.853
12	23 47 27.35	1.8034	4 6 23.3	12.513	12	1 15 26.16	1.7854	13 32 3.6	10.802
13	23 49 15.56	1.8036	4 18 53.6	12.495	13	1 17 19.38	1.7886	13 42 50.2	10.750
14	23 51 3.79	1.8040	4 31 22.7	12.474	14	1 19 12.78	1.8015	13 53 33.6	10.697
15	23 52 52.04	1.8043	4 43 50.5	12.452	15	1 21 6.37	1.8047	14 4 13.8	10.643
16	23 54 40.31	1.8047	4 56 16.9	12.430	16	1 23 0.15	1.8080	14 14 50.8	10.589
17	23 56 28.61	1.8053	5 8 42.0	12.407	17	1 24 54.13	1.8012	14 25 24.5	10.534
18	23 58 16.95	1.8059	5 21 5.7	12.382	18	1 26 48.30	1.8045	14 35 54.9	10.478
19	0 0 5.32	1.8065	5 33 27.9	12.356	19	1 28 42.67	1.8079	14 46 21.9	10.421
20	0 1 53.73	1.8071	5 45 48.7	12.333	20	1 30 37.25	1.8113	14 56 45.4	10.363
21	0 3 42.18	1.8080	5 58 7.9	12.307	21	1 32 32.03	1.8147	15 7 5.5	10.305
22	0 5 30.69	1.8086	6 10 25.6	12.282	22	1 34 27.02	1.8183	15 17 22.0	10.246
23	0 7 19.24	1.8096	N. 6° 22' 41.7"	12.255	23	1 36 22.23	1.8218	N. 15° 27' 35.0"	10.186
SUNDAY 2.					TUESDAY 4.				
0	0 9 7.85	1.8106	N. 6° 34' 56.1"	12.227	0	1 38 17.64	1.8253	N. 15° 37' 44.3"	10.126
1	0 10 56.52	1.8116	6 47 8.9	12.198	1	1 40 13.27	1.8290	15 47 50.0	10.084
2	0 12 45.25	1.8128	6 59 19.9	12.169	2	1 42 9.12	1.8325	15 57 52.0	10.042
3	0 14 34.06	1.8140	7 11 29.2	12.140	3	1 44 5.18	1.8362	16 7 50.2	9.999
4	0 16 22.93	1.8151	7 23 36.7	12.110	4	1 46 1.47	1.8400	16 17 44.7	9.976
5	0 18 11.88	1.8165	7 35 42.4	12.079	5	1 47 57.98	1.8437	16 27 35.3	9.912
6	0 20 0.91	1.8178	7 47 46.2	12.048	6	1 49 54.72	1.8475	16 37 22.1	9.847
7	0 21 50.02	1.8191	7 59 48.2	12.017	7	1 51 51.69	1.8514	16 47 4.8	9.780
8	0 23 39.21	1.8205	8 11 48.2	11.984	8	1 53 48.89	1.8552	16 56 43.7	9.712
9	0 25 28.49	1.8221	8 23 46.3	11.951	9	1 55 46.32	1.8591	17 6 18.5	9.646
10	0 27 17.87	1.8238	8 35 42.3	11.917	10	1 57 43.99	1.8631	17 15 49.2	9.577
11	0 29 7.35	1.8254	8 47 36.3	11.882	11	1 59 41.90	1.8671	17 25 15.8	9.508
12	0 30 56.92	1.8270	8 59 28.2	11.847	12	2 1 40.05	1.8710	17 34 38.2	9.438
13	0 32 46.60	1.8289	9 11 18.0	11.813	13	2 3 38.43	1.8750	17 43 56.4	9.367
14	0 34 36.39	1.8307	9 23 5.6	11.778	14	2 5 37.06	1.8792	17 53 10.3	9.296
15	0 36 26.29	1.8325	9 34 51.0	11.738	15	2 7 35.94	1.8833	18 2 19.9	9.223
16	0 38 16.30	1.8344	9 46 34.2	11.700	16	2 9 35.06	1.8874	18 11 25.1	9.150
17	0 40 6.43	1.8363	9 58 15.0	11.662	17	2 11 34.43	1.8915	18 20 25.9	9.076
18	0 41 56.69	1.8386	10 9 53.6	11.623	18	2 13 34.05	1.8956	18 29 22.2	8.991
19	0 43 47.07	1.8407	10 21 29.7	11.582	19	2 15 33.91	1.8997	18 38 14.0	8.915
20	0 45 37.58	1.8430	10 33 3.5	11.543	20	2 17 34.02	1.9040	18 47 1.2	8.847
21	0 47 28.23	1.8452	10 44 34.8	11.503	21	2 19 34.39	1.9082	18 55 43.7	8.779
22	0 49 19.01	1.8475	10 56 3.7	11.460	22	2 21 35.01	1.9124	19 4 21.6	8.709
23	0 51 9.93	1.8499	11 7 30.0	11.417	23	2 23 35.88	1.9166	19 12 54.7	8.638
24	0 53 1.00	1.8523	N. 11° 18' 53.8"	11.375	24	2 25 37.01	1.9210	N. 19° 21' 23.1"	8.563

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 5.					FRIDAY 7.				
0	2 25 37.01	2.0910	N.19° 21' 23.1	8.493	0	4 7 33.80	2.3908	N.24° 17' 59.5	2.613
1	2 27 38.40	2.0232	19 29 46.6	8.323	1	4 9 47.12	2.3237	24 21 32.7	2.494
2	2 29 40.04	2.0396	19 38 5.3	8.370	2	4 12 0.65	2.3273	24 24 58.8	2.374
3	2 31 41.94	2.0328	19 46 19.0	8.187	3	4 14 14.39	2.3306	24 28 17.6	2.252
4	2 33 44.10	2.0381	19 54 27.8	8.104	4	4 16 28.33	2.3339	24 31 29.1	2.132
5	2 35 46.52	2.0426	20 2 31.5	8.026	5	4 18 42.46	2.3271	24 34 33.4	2.010
6	2 37 49.20	2.0468	20 10 30.2	7.965	6	4 20 56.79	2.3403	24 37 30.3	2.886
7	2 39 52.14	2.0513	20 18 23.7	7.949	7	4 23 11.30	2.3438	24 40 19.8	2.764
8	2 41 55.35	2.0556	20 26 12.1	7.793	8	4 25 25.99	2.3463	24 43 2.0	2.641
9	2 43 58.82	2.0600	20 33 55.2	7.676	9	4 27 40.86	2.3492	24 45 36.7	2.517
10	2 46 2.55	2.0643	20 41 33.1	7.607	10	4 29 55.91	2.3523	24 48 4.0	2.392
11	2 48 6.54	2.0686	20 49 5.6	7.497	11	4 32 11.14	2.3551	24 50 23.8	2.267
12	2 50 10.79	2.0730	20 56 32.7	7.386	12	4 34 26.53	2.3579	24 52 36.0	2.141
13	2 52 15.31	2.0775	21 3 54.3	7.316	13	4 36 42.09	2.3606	24 54 40.7	2.014
14	2 54 20.09	2.0819	21 11 10.5	7.233	14	4 38 57.81	2.3632	24 56 37.7	1.897
15	2 56 25.14	2.0863	21 18 21.1	7.131	15	4 41 13.68	2.3658	24 58 27.1	1.780
16	2 58 30.45	2.0906	21 25 26.2	7.087	16	4 43 29.71	2.3683	25 0 8.9	1.662
17	3 0 36.02	2.0951	21 32 25.6	6.949	17	4 45 45.88	2.3707	25 1 43.0	1.543
18	3 2 41.86	2.0995	21 39 19.3	6.847	18	4 48 2.20	2.3731	25 3 9.3	1.374
19	3 4 47.96	2.1038	21 46 7.2	6.751	19	4 50 18.66	2.3754	25 4 27.9	1.246
20	3 6 54.32	2.1081	21 52 49.4	6.654	20	4 52 35.25	2.3776	25 5 38.8	1.116
21	3 9 0.94	2.1123	21 59 25.7	6.567	21	4 54 51.97	2.3797	25 6 41.8	0.986
22	3 11 7.83	2.1166	22 5 56.2	6.466	22	4 57 8.82	2.3818	25 7 37.1	0.866
23	3 13 14.97	2.1211	N.22° 12' 20.7	6.366	23	4 59 25.79	2.3838	N.25° 8' 24.5	0.734
THURSDAY 6.					SATURDAY 8.				
0	3 15 22.37	2.1256	N.22° 18' 39.9	6.267	0	5 1 42.88	2.3867	N.25° 9' 4.0	0.588
1	3 17 30.03	2.1297	22 24 51.6	6.167	1	5 4 0.08	2.3874	25 9 35.7	0.462
2	3 19 37.94	2.1340	22 30 58.0	6.066	2	5 6 17.39	2.3894	25 9 59.4	0.339
3	3 21 46.11	2.1383	22 36 58.2	5.963	3	5 8 34.81	2.3910	25 10 15.2	0.197
4	3 23 54.54	2.1426	22 42 52.2	5.849	4	5 10 52.32	2.3926	25 10 23.1	0.066
5	3 26 3.22	2.1468	22 48 40.0	5.744	5	5 13 9.92	2.3940	25 10 23.0	0.067
6	3 28 12.14	2.1509	22 54 21.5	5.638	6	5 15 27.61	2.3955	25 10 15.0	0.200
7	3 30 21.32	2.1550	22 59 56.6	5.532	7	5 17 45.39	2.3970	25 9 59.0	0.338
8	3 32 30.75	2.1591	23 5 25.4	5.426	8	5 20 3.25	2.3983	25 9 35.0	0.467
9	3 34 40.43	2.1632	23 10 47.7	5.319	9	5 22 21.18	2.3994	25 9 3.0	0.601
10	3 36 50.35	2.1674	23 16 3.6	5.210	10	5 24 39.18	2.3996	25 8 22.9	0.735
11	3 39 0.52	2.1714	23 21 12.9	5.101	11	5 26 57.25	2.3916	25 7 34.8	0.866
12	3 41 10.92	2.1753	23 26 15.7	4.991	12	5 29 15.37	2.3926	25 6 38.7	1.002
13	3 43 21.56	2.1792	23 31 11.8	4.880	13	5 31 33.55	2.3934	25 5 34.5	1.137
14	3 45 32.44	2.1833	23 36 1.3	4.769	14	5 33 51.78	2.3942	25 4 22.2	1.272
15	3 47 43.56	2.1873	23 40 44.1	4.657	15	5 36 10.06	2.3949	25 3 1.9	1.408
16	3 49 54.92	2.1911	23 45 20.1	4.543	16	5 38 28.37	2.3955	25 1 33.5	1.541
17	3 52 6.50	2.1949	23 49 49.3	4.430	17	5 40 46.72	2.3960	24 59 57.0	1.675
18	3 54 18.31	2.1986	23 54 11.6	4.316	18	5 43 5.10	2.3965	24 58 12.5	1.809
19	3 56 30.34	2.2024	23 58 27.1	4.200	19	5 45 23.50	2.3969	24 56 19.9	1.944
20	3 58 42.60	2.2061	24 2 35.6	4.084	20	5 47 41.93	2.3973	24 54 19.2	2.079
21	4 0 55.08	2.2097	24 6 37.2	3.967	21	5 50 0.37	2.3974	24 52 10.4	2.214
22	4 3 7.77	2.2133	24 10 31.7	3.850	22	5 52 18.82	2.3975	24 49 53.5	2.348
23	4 5 20.68	2.2169	24 14 19.2	3.733	23	5 54 37.28	2.3976	24 47 28.6	2.483
24	4 7 33.80	2.2206	N.24° 17' 59.5	3.613	24	5 56 55.74	2.3976	N.24° 44' 55.6	2.617

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 9.					TUESDAY 11.				
0	5 56 55.74	2.3076	N.24° 44' 55.6"	2.617	0	7 46 21.71	2.3312	N.20° 9' 50.3"	8.637
1	5 59 14.20	2.3075	24 42 14.5	2.732	1	7 48 35.51	2.3296	20 1 7.8	8.768
2	6 1 32.65	2.3073	24 39 25.3	2.987	2	7 50 49.15	2.3280	19 52 18.3	8.878
3	6 3 51.08	2.3070	24 36 28.1	3.020	3	7 53 2.63	2.3233	19 43 22.2	8.988
4	6 6 9.49	2.3068	24 33 22.9	3.154	4	7 55 15.95	2.3206	19 34 19.5	9.097
5	6 8 27.88	2.3063	24 30 9.6	3.288	5	7 57 29.11	2.3180	19 25 10.1	9.205
6	6 10 46.25	2.3058	24 26 48.3	3.422	6	7 59 42.11	2.3163	19 15 54.7	9.312
7	6 13 4.58	2.3062	24 23 19.0	3.555	7	8 1 54.95	2.3136	19 6 32.9	9.418
8	6 15 22.88	2.3046	24 19 41.7	3.688	8	8 4 7.63	2.3099	18 57 4.7	9.524
9	6 17 41.14	2.3040	24 15 56.4	3.822	9	8 6 20.14	2.3073	18 47 30.1	9.628
10	6 19 59.36	2.3031	24 12 3.1	3.954	10	8 8 32.50	2.3045	18 37 49.3	9.732
11	6 22 17.52	2.3023	24 8 1.9	4.087	11	8 10 44.68	2.3017	18 28 2.3	9.834
12	6 24 35.64	2.3014	24 3 52.7	4.219	12	8 12 56.71	2.2990	18 18 9.2	9.936
13	6 26 53.69	2.3003	23 59 35.6	4.351	13	8 15 8.57	2.2963	18 8 10.0	10.037
14	6 29 11.68	2.2998	23 55 10.6	4.482	14	8 17 20.27	2.2936	17 58 4.8	10.137
15	6 31 29.61	2.2989	23 50 37.7	4.614	15	8 19 31.81	2.2910	17 47 53.6	10.236
16	6 33 47.47	2.2970	23 45 56.9	4.745	16	8 21 43.19	2.2883	17 37 36.5	10.334
17	6 36 5.25	2.2967	23 41 8.3	4.876	17	8 23 54.41	2.2855	17 27 13.5	10.431
18	6 38 22.96	2.2944	23 36 11.8	5.007	18	8 26 5.46	2.2828	17 16 44.8	10.527
19	6 40 40.58	2.2930	23 31 7.5	5.136	19	8 28 16.35	2.2802	17 6 10.3	10.623
20	6 42 58.12	2.2917	23 25 55.5	5.265	20	8 30 27.09	2.2776	16 55 30.1	10.718
21	6 45 15.57	2.2900	23 20 35.7	5.394	21	8 32 37.67	2.2750	16 44 44.3	10.810
22	6 47 32.92	2.2883	23 15 8.2	5.522	22	8 34 48.09	2.2723	16 33 52.9	10.902
23	6 49 50.18	2.2867	N.23 9 33.0	5.651	23	8 36 58.35	2.2697	N.16 22 56.0	10.993
MONDAY 10.					WEDNESDAY 12.				
0	6 52 7.33	2.2850	N.23 3 50.1	5.778	0	8 39 8.46	2.2671	N.16 11 53.7	11.084
1	6 54 24.38	2.2833	22 57 59.6	5.906	1	8 41 18.41	2.2645	16 0 45.9	11.174
2	6 56 41.33	2.2815	22 52 1.4	6.032	2	8 43 28.21	2.2620	15 49 32.8	11.262
3	6 58 58.17	2.2797	22 45 55.7	6.157	3	8 45 37.86	2.2595	15 38 14.4	11.351
4	7 1 14.89	2.2777	22 39 42.5	6.283	4	8 47 47.34	2.2570	15 26 50.7	11.437
5	7 3 31.50	2.2758	22 33 21.7	6.408	5	8 49 56.69	2.2545	15 15 21.9	11.523
6	7 5 47.99	2.2738	22 26 53.5	6.533	6	8 52 5.89	2.2520	15 3 48.0	11.607
7	7 8 4.36	2.2717	22 20 17.8	6.657	7	8 54 14.94	2.2495	14 52 9.1	11.690
8	7 10 20.60	2.2696	22 13 34.7	6.780	8	8 56 23.84	2.2473	14 40 25.2	11.772
9	7 12 36.72	2.2676	22 6 44.2	6.902	9	8 58 32.61	2.2449	14 28 36.4	11.854
10	7 14 52.71	2.2654	21 59 46.4	7.024	10	9 0 41.23	2.2426	14 16 42.7	11.935
11	7 17 8.57	2.2631	21 52 41.3	7.145	11	9 2 49.72	2.2403	14 4 44.2	12.015
12	7 19 24.29	2.2608	21 45 29.0	7.266	12	9 4 58.07	2.2380	13 52 40.9	12.094
13	7 21 39.87	2.2585	21 38 9.4	7.386	13	9 7 6.28	2.2356	13 40 32.9	12.173
14	7 23 55.31	2.2562	21 30 42.7	7.505	14	9 9 14.37	2.2333	13 28 20.3	12.246
15	7 26 10.62	2.2539	21 23 8.8	7.623	15	9 11 22.32	2.2314	13 16 3.1	12.323
16	7 28 25.78	2.2515	21 15 28.0	7.741	16	9 13 30.14	2.2292	13 3 41.5	12.396
17	7 30 40.80	2.2490	21 7 40.0	7.858	17	9 15 37.83	2.2273	12 51 15.4	12.472
18	7 32 55.67	2.2468	20 59 45.0	7.974	18	9 17 45.41	2.2252	12 38 44.9	12.545
19	7 35 10.39	2.2440	20 51 43.1	8.089	19	9 19 52.86	2.2230	12 26 10.0	12.616
20	7 37 24.96	2.2415	20 43 34.2	8.204	20	9 22 0.19	2.2212	12 13 31.1	12.685
21	7 39 39.38	2.2390	20 35 18.5	8.319	21	9 24 7.41	2.2193	12 0 47.9	12.756
22	7 41 53.65	2.2365	20 26 55.9	8.433	22	9 26 14.51	2.2174	11 48 0.5	12.823
23	7 44 7.76	2.2338	20 18 26.5	8.546	23	9 28 21.50	2.2156	11 35 9.1	12.890
24	7 46 21.71	2.2312	N.20 9 50.3	8.657	24	9 30 28.39	2.2138	N.11 22 13.7	12.956

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 13.					SATURDAY 15.				
0	9 30 28.39	2.1139	N. 11° 22' 13.7"	13.366	0	11 11 0.21	2.1003	N. 0° 5' 3.7"	14.818
1	9 32 35.17	2.1191	11 9 14.4	13.091	1	11 13 6.27	2.1017	S. 0 9 45.7	14.828
2	9 34 41.85	2.1106	10 56 11.2	13.066	2	11 15 12.42	2.1032	0 24 35.7	14.837
3	9 36 48.43	2.1089	10 43 4.2	13.148	3	11 17 18.66	2.1048	0 39 26.2	14.845
4	9 38 54.92	2.1074	10 29 53.4	13.211	4	11 19 25.00	2.1066	0 54 17.1	14.851
5	9 41 1.31	2.1067	10 16 38.9	13.272	5	11 21 31.45	2.1084	1 9 8.3	14.856
6	9 43 7.61	2.1043	10 3 20.8	13.331	6	11 23 38.01	2.1102	1 23 59.8	14.860
7	9 45 13.83	2.1029	9 49 59.2	13.389	7	11 25 44.68	2.1120	1 36 51.5	14.862
8	9 47 19.96	2.1015	9 36 34.1	13.447	8	11 27 51.46	2.1140	1 53 43.3	14.863
9	9 49 26.02	2.1003	9 23 5.6	13.503	9	11 29 58.37	2.1162	2 8 35.1	14.862
10	9 51 32.00	2.0990	9 9 33.7	13.566	10	11 32 5.41	2.1183	2 23 26.8	14.861
11	9 53 37.90	2.0977	8 55 58.6	13.612	11	11 34 12.57	2.1206	2 38 18.4	14.858
12	9 55 43.73	2.0965	8 42 20.2	13.665	12	11 36 19.87	2.1229	2 53 9.7	14.853
13	9 57 49.50	2.0955	8 28 38.6	13.717	13	11 38 27.32	2.1253	3 8 0.8	14.848
14	9 59 55.20	2.0945	8 14 54.0	13.768	14	11 40 34.91	2.1276	3 22 51.5	14.841
15	10 2 0.85	2.0936	8 1 6.4	13.818	15	11 42 42.64	2.1300	3 37 41.7	14.832
16	10 4 6.44	2.0927	7 47 15.8	13.867	16	11 44 50.52	2.1326	3 52 31.4	14.823
17	10 6 11.98	2.0920	7 33 22.3	13.915	17	11 46 58.56	2.1354	4 7 20.5	14.812
18	10 8 17.48	2.0912	7 19 26.0	13.962	18	11 49 6.77	2.1382	4 22 8.9	14.800
19	10 10 22.93	2.0905	7 5 26.9	14.007	19	11 51 15.15	2.1410	4 36 56.5	14.786
20	10 12 28.34	2.0898	6 51 25.2	14.061	20	11 53 23.70	2.1439	4 51 43.2	14.770
21	10 14 33.71	2.0892	6 37 20.8	14.095	21	11 55 32.42	2.1469	5 6 28.9	14.758
22	10 16 39.05	2.0888	6 23 13.8	14.127	22	11 57 41.33	2.1500	5 21 13.6	14.736
23	10 18 44.37	2.0885	N. 6 9 4.4	14.177	23	11 59 50.42	2.1531	S. 5 35 57.2	14.716
FRIDAY 14.					SUNDAY 16.				
0	10 20 49.66	2.0880	N. 5 54 52.5	14.217	0	12 1 59.71	2.1564	S. 5 50 39.5	14.695
1	10 22 54.93	2.0877	5 40 38.3	14.266	1	12 4 9.19	2.1596	6 5 20.6	14.672
2	10 25 0.19	2.0875	5 26 21.8	14.293	2	12 6 18.87	2.1630	6 20 0.2	14.648
3	10 27 5.43	2.0873	5 12 3.1	14.330	3	12 8 28.76	2.1665	6 34 38.4	14.624
4	10 29 10.67	2.0872	4 57 42.2	14.365	4	12 10 38.85	2.1700	6 49 15.1	14.599
5	10 31 15.90	2.0871	4 43 19.3	14.399	5	12 12 49.16	2.1736	7 3 50.2	14.570
6	10 33 21.13	2.0873	4 28 54.3	14.433	6	12 14 59.69	2.1778	7 18 23.5	14.541
7	10 35 26.37	2.0874	4 14 27.4	14.463	7	12 17 10.44	2.1810	7 32 55.1	14.510
8	10 37 31.62	2.0875	3 59 58.7	14.493	8	12 19 21.41	2.1847	7 47 24.7	14.477
9	10 39 36.88	2.0878	3 45 28.2	14.523	9	12 21 32.61	2.1886	8 1 52.3	14.443
10	10 41 42.16	2.0881	3 30 55.9	14.552	10	12 23 44.05	2.1926	8 16 17.9	14.408
11	10 43 47.46	2.0885	3 16 22.0	14.578	11	12 25 55.73	2.1967	8 30 41.3	14.371
12	10 45 52.78	2.0889	3 1 46.5	14.604	12	12 28 7.66	2.2008	8 45 2.4	14.332
13	10 47 58.13	2.0894	2 47 9.5	14.629	13	12 30 19.83	2.2049	8 59 21.1	14.292
14	10 50 3.51	2.0900	2 32 31.0	14.653	14	12 32 32.25	2.2091	9 13 37.4	14.251
15	10 52 8.93	2.0907	2 17 51.2	14.674	15	12 34 44.93	2.2135	9 27 51.2	14.207
16	10 54 14.40	2.0915	2 3 10.1	14.695	16	12 36 57.87	2.2179	9 42 2.3	14.163
17	10 56 19.91	2.0923	1 48 27.8	14.715	17	12 39 11.08	2.2223	9 56 10.8	14.117
18	10 58 25.48	2.0933	1 33 44.3	14.734	18	12 41 24.55	2.2269	10 10 16.4	14.069
19	11 0 31.10	2.0941	1 18 59.7	14.751	19	12 43 38.29	2.2313	10 24 19.1	14.020
20	11 2 38.78	2.0952	1 4 14.2	14.766	20	12 45 52.31	2.2360	10 38 18.8	13.969
21	11 4 42.53	2.0963	0 49 27.8	14.781	21	12 48 6.61	2.2406	10 52 15.4	13.916
22	11 6 48.34	2.0975	0 34 40.5	14.795	22	12 50 21.19	2.2453	11 6 8.8	13.862
23	11 8 54.23	2.0989	0 19 52.4	14.807	23	12 52 36.05	2.2500	11 19 58.9	13.807
24	11 11 0.21	2.1003	N. 0 5 3.7	14.818	24	12 54 51.20	2.2550	S. 11 33 45.6	13.750

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 17.					WEDNESDAY 19.				
0	12 54 51.20	2.2660	S. 11° 33' 45.6	13.760	0	14 49 25.32	2.0224	S. 20° 56' 0.5	9.036
1	12 57 6.65	2.2600	11 47 28.9	13.691	1	14 51 56.89	2.0267	21 4 58.5	8.997
2	12 59 22.40	2.2649	12 1 8.5	13.629	2	14 54 28.77	2.0340	21 13 48.1	8.766
3	13 1 38.44	2.2699	12 14 44.4	13.567	3	14 57 0.97	2.0393	21 22 29.2	8.614
4	13 3 54.79	2.2750	12 28 16.6	13.504	4	14 59 33.48	2.0444	21 31 1.8	8.472
5	13 6 11.45	2.2801	12 41 44.9	13.438	5	15 2 6.30	2.0495	21 39 25.8	8.327
6	13 8 28.41	2.2853	12 55 9.2	13.371	6	15 4 39.42	2.0545	21 47 41.0	8.181
7	13 10 45.69	2.2905	13 9 29.4	13.302	7	15 7 12.84	2.0596	21 55 47.5	8.035
8	13 13 3.28	2.2958	13 21 45.5	13.233	8	15 9 46.56	2.0646	22 3 45.0	7.897
9	13 15 21.19	2.3012	13 34 57.3	13.160	9	15 12 20.58	2.0698	22 11 33.5	7.756
10	13 17 39.43	2.3066	13 48 4.7	13.086	10	15 14 54.88	2.0750	22 19 13.0	7.622
11	13 19 57.99	2.3120	14 1 7.6	13.011	11	15 17 29.45	2.0798	22 26 43.3	7.488
12	13 22 16.87	2.3174	14 14 6.0	12.933	12	15 20 4.30	2.0850	22 34 4.4	7.373
13	13 24 36.08	2.3229	14 26 59.6	12.854	13	15 22 39.42	2.0897	22 41 16.1	7.116
14	13 26 55.62	2.3285	14 39 48.5	12.774	14	15 25 14.81	2.0949	22 48 18.4	6.989
15	13 29 15.50	2.3340	14 52 32.5	12.692	15	15 27 50.45	2.0991	22 55 11.2	6.860
16	13 31 35.71	2.3396	15 5 11.5	12.607	16	15 30 26.35	2.0008	23 1 54.4	6.640
17	13 33 56.26	2.3452	15 17 45.4	12.522	17	15 33 2.49	2.0044	23 8 28.0	6.479
18	13 36 17.14	2.3509	15 30 14.1	12.434	18	15 35 38.88	2.0084	23 14 51.9	6.317
19	13 38 38.37	2.3566	15 32 37.5	12.346	19	15 38 15.50	2.0121	23 21 6.1	6.184
20	13 40 59.94	2.3624	15 54 55.6	12.256	20	15 40 52.34	2.0166	23 27 10.4	5.990
21	13 43 21.86	2.3681	16 7 8.1	12.162	21	15 43 29.40	2.0196	23 33 4.8	5.894
22	13 45 44.12	2.3739	16 19 15.0	12.067	22	15 46 6.68	2.0220	23 38 49.3	5.686
23	13 48 6.73	2.3797	S. 16° 31' 16.2	11.973	23	15 48 44.16	2.0263	S. 23° 44' 23.8	5.481
TUESDAY 18.					THURSDAY 20.				
0	13 50 29.69	2.3856	S. 16° 43' 11.5	11.874	0	15 51 21.83	2.0294	S. 23° 49' 48.2	5.322
1	13 52 53.00	2.3914	16 55 1.0	11.778	1	15 53 59.69	2.0325	23 55 2.5	5.184
2	13 55 16.66	2.3972	17 6 44.5	11.674	2	15 56 37.74	2.0355	24 0 6.7	4.966
3	13 57 40.67	2.4030	17 18 21.9	11.572	3	15 59 15.96	2.0384	24 5 0.7	4.814
4	14 0 5.03	2.4089	17 29 53.1	11.467	4	16 1 54.35	2.0411	24 9 44.4	4.643
5	14 2 29.74	2.4147	17 41 18.0	11.362	5	16 4 32.90	2.0436	24 14 17.8	4.471
6	14 4 54.80	2.4206	17 52 36.5	11.254	6	16 7 11.59	2.0460	24 18 40.9	4.297
7	14 7 20.22	2.4265	18 3 48.5	11.144	7	16 9 50.42	2.0483	24 22 53.5	4.194
8	14 9 45.99	2.4324	18 14 53.8	11.033	8	16 12 29.39	2.0505	24 26 55.8	3.961
9	14 12 12.11	2.4383	18 25 52.5	10.921	9	16 15 8.48	2.0525	24 30 47.5	3.778
10	14 14 38.58	2.4440	18 36 44.3	10.807	10	16 17 47.69	2.0543	24 34 28.8	3.601
11	14 17 5.40	2.4499	18 47 29.3	10.691	11	16 20 27.00	2.0560	24 37 59.6	3.426
12	14 19 32.57	2.4557	18 58 7.2	10.573	12	16 23 6.41	2.0575	24 41 19.8	3.269
13	14 22 0.09	2.4615	19 8 38.1	10.454	13	16 25 45.91	2.0590	24 44 29.5	3.072
14	14 24 27.95	2.4673	19 19 1.7	10.333	14	16 28 25.49	2.0603	24 47 28.5	2.886
15	14 26 56.16	2.4730	19 29 18.1	10.211	15	16 31 5.14	2.0613	24 50 16.9	2.716
16	14 29 24.72	2.4788	19 39 27.0	10.087	16	16 33 44.85	2.0622	24 52 54.7	2.541
17	14 31 53.62	2.4845	19 49 28.5	9.961	17	16 36 24.61	2.0630	24 55 21.8	2.362
18	14 34 22.86	2.4901	19 59 22.3	9.833	18	16 39 4.41	2.0635	24 57 38.2	2.186
19	14 36 52.44	2.4957	20 9 8.5	9.704	19	16 41 44.24	2.0640	24 59 44.0	2.007
20	14 39 22.35	2.5013	20 18 46.8	9.573	20	16 44 24.09	2.0643	25 1 39.0	1.827
21	14 41 52.60	2.5069	20 28 17.3	9.441	21	16 47 3.95	2.0643	25 3 23.3	1.648
22	14 44 23.18	2.5123	20 37 39.8	9.307	22	16 49 43.81	2.0643	25 4 56.8	1.470
23	14 46 54.08	2.5178	20 46 54.2	9.173	23	16 52 23.66	2.0640	25 6 19.7	1.292
24	14 49 25.32	2.5234	S. 20° 56' 0.5	9.036	24	16 55 3.50	2.0637	S. 25° 7' 31.8	1.113

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	D ^M for 1 m.	Declination.	D ^M for 1 m.	Hour.	Right Ascension.	D ^M for 1 m.	Declination.	D ^M for 1 m.
FRIDAY 21.					SUNDAY 23.				
0	16 55 3.50	2.6037	S. 25° 7' 31.8	1.113	0	18 59 33.32	2.4738	S. 22° 43' 59.2	6.788
1	16 57 43.31	2.6031	25 8 33.2	0.933	1	19 2 1.55	2.4671	22 37 10.8	6.973
2	17 0 23.08	2.6023	25 9 23.8	0.764	2	19 4 29.38	2.4606	22 30 14.4	7.007
3	17 3 2.79	2.6013	25 10 3.7	0.578	3	19 6 56.81	2.4538	22 23 10.0	7.146
4	17 5 42.43	2.6001	25 10 32.9	0.397	4	19 9 23.84	2.4470	22 15 57.6	7.271
5	17 8 22.01	2.5990	25 10 51.4	0.220	5	19 11 50.46	2.4402	22 8 37.5	7.400
6	17 11 1.51	2.5976	25 10 59.3	0.043	6	19 14 16.67	2.4333	22 1 9.7	7.527
7	17 13 40.93	2.5961	25 10 56.4	0.137	7	19 16 42.46	2.4268	21 53 34.3	7.653
8	17 16 20.25	2.5944	25 10 42.8	0.315	8	19 19 7.83	2.4193	21 45 51.3	7.777
9	17 18 59.46	2.5926	25 10 18.6	0.492	9	19 21 32.78	2.4123	21 38 1.0	7.900
10	17 21 38.55	2.5906	25 9 43.8	0.668	10	19 23 57.31	2.4058	21 30 3.3	8.023
11	17 24 17.52	2.5883	25 8 58.4	0.845	11	19 26 21.42	2.3988	21 21 58.4	8.142
12	17 26 56.35	2.5860	25 8 2.4	1.023	12	19 28 45.11	2.3913	21 13 46.3	8.260
13	17 29 35.04	2.5836	25 6 55.8	1.197	13	19 31 8.37	2.3840	21 5 27.2	8.376
14	17 32 13.58	2.5809	25 5 38.7	1.373	14	19 33 31.20	2.3769	20 57 1.2	8.490
15	17 34 51.95	2.5790	25 4 11.1	1.547	15	19 35 53.60	2.3696	20 48 28.4	8.608
16	17 37 30.15	2.5761	25 2 33.1	1.720	16	19 38 15.56	2.3624	20 39 48.8	8.716
17	17 40 8.17	2.5730	25 0 44.7	1.894	17	19 40 37.09	2.3552	20 31 2.6	8.826
18	17 42 46.00	2.5698	24 58 45.9	2.066	18	19 42 58.19	2.3480	20 22 9.8	8.934
19	17 45 23.63	2.5666	24 56 36.8	2.237	19	19 45 18.86	2.3409	20 13 10.5	9.041
20	17 48 1.06	2.5630	24 54 17.4	2.408	20	19 47 39.11	2.3336	20 4 4.9	9.146
21	17 50 38.27	2.5592	24 51 47.8	2.577	21	19 49 58.91	2.3264	19 54 53.0	9.249
22	17 53 15.25	2.5544	24 49 8.1	2.746	22	19 52 18.28	2.3192	19 45 35.0	9.351
23	17 55 52.00	2.5496	S. 24 46 18.3	2.914	23	19 54 37.22	2.3120	S. 19 36 10.9	9.452
SATURDAY 22.					MONDAY 24.				
0	17 58 28.51	2.5464	S. 24 43 18.4	3.081	0	19 56 55.71	2.3047	S. 19 26 40.8	9.551
1	18 1 4.77	2.5421	24 40 8.5	3.247	1	19 59 13.78	2.2975	19 17 4.8	9.647
2	18 3 40.77	2.5378	24 36 48.7	3.413	2	20 1 31.41	2.2902	19 7 23.1	9.743
3	18 6 16.51	2.5333	24 33 19.0	3.578	3	20 3 48.61	2.2830	18 57 35.7	9.837
4	18 8 51.97	2.5286	24 29 39.6	3.739	4	20 6 5.37	2.2757	18 47 42.6	9.931
5	18 11 27.15	2.5240	24 25 50.3	3.901	5	20 8 21.70	2.2685	18 37 44.0	10.021
6	18 14 2.05	2.5191	24 21 51.4	4.063	6	20 10 37.60	2.2615	18 27 40.1	10.110
7	18 16 36.65	2.5141	24 17 42.9	4.223	7	20 12 53.08	2.2544	18 17 30.8	10.197
8	18 19 10.95	2.5090	24 13 24.8	4.381	8	20 15 8.12	2.2473	18 7 16.4	10.283
9	18 21 44.94	2.5038	24 8 57.2	4.538	9	20 17 22.74	2.2400	17 56 56.8	10.368
10	18 24 18.61	2.5005	24 4 20.2	4.694	10	20 19 36.93	2.2330	17 46 32.2	10.462
11	18 26 51.96	2.5030	23 59 33.9	4.849	11	20 21 50.70	2.2269	17 36 2.6	10.553
12	18 29 24.97	2.4974	23 54 38.3	5.003	12	20 24 4.04	2.2189	17 25 28.2	10.613
13	18 31 57.65	2.4918	23 49 33.5	5.154	13	20 26 16.97	2.2120	17 14 49.1	10.691
14	18 34 29.99	2.4860	23 44 19.7	5.305	14	20 28 29.48	2.2050	17 4 5.3	10.768
15	18 37 1.97	2.4800	23 38 56.9	5.455	15	20 30 41.57	2.1980	16 53 16.9	10.843
16	18 39 33.60	2.4741	23 33 25.1	5.603	16	20 32 53.25	2.1912	16 42 24.1	10.917
17	18 42 4.87	2.4681	23 27 44.5	5.750	17	20 35 4.52	2.1844	16 31 26.8	10.990
18	18 44 35.78	2.4620	23 21 55.1	5.896	18	20 37 15.38	2.1776	16 20 25.3	11.061
19	18 47 6.32	2.4560	23 15 57.0	6.040	19	20 39 25.84	2.1709	16 9 19.5	11.131
20	18 49 36.49	2.4505	23 9 50.3	6.183	20	20 41 35.89	2.1641	15 58 9.6	11.199
21	18 52 6.27	2.4451	23 3 35.1	6.324	21	20 43 45.54	2.1575	15 46 55.6	11.266
22	18 54 35.67	2.4398	22 57 11.4	6.464	22	20 45 54.79	2.1508	15 35 37.7	11.331
23	18 57 4.69	2.4344	22 50 39.4	6.603	23	20 48 3.64	2.1440	15 24 15.9	11.395
24	18 59 33.32	2.4288	S. 22 43 59.2	6.738	24	20 50 12.09	2.1375	S. 15 12 50.3	11.457

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 25.					THURSDAY 27.				
0	^h 20 ^m 50 ^s 12.09	2.1375	S. 15° 12' 50.3"	11.457	0	^h 22 ^m 26 ^s 25.31	1.8976	S. 5° 15' 2.2"	13.022
1	20 52 20.15	2.1311	15 1 21.0	11.518	1	22 28 19.06	1.8943	5 2 0.7	13.029
2	20 54 27.83	2.1247	14 49 48.1	11.577	2	22 30 12.62	1.8910	4 48 58.7	13.036
3	20 56 35.12	2.1183	14 38 11.7	11.636	3	22 32 5.99	1.8880	4 35 56.4	13.041
4	20 58 42.03	2.1120	14 26 31.8	11.692	4	22 33 59.18	1.8849	4 22 53.8	13.046
5	21 0 48.56	2.1057	14 14 48.6	11.748	5	22 35 52.18	1.8819	4 9 50.9	13.050
6	21 2 54.72	2.0995	14 3 2.0	11.803	6	22 37 45.01	1.8790	3 56 47.8	13.053
7	21 5 0.51	2.0933	13 51 12.2	11.856	7	22 39 37.67	1.8761	3 43 44.5	13.057
8	21 7 5.92	2.0871	13 39 19.4	11.907	8	22 41 30.15	1.8733	3 30 41.1	13.059
9	21 9 10.97	2.0811	13 27 23.5	11.957	9	22 43 22.47	1.8707	3 17 37.6	13.063
10	21 11 15.66	2.0751	13 15 24.6	12.006	10	22 45 14.64	1.8681	3 4 34.1	13.066
11	21 13 19.99	2.0692	13 3 22.9	12.052	11	22 47 6.65	1.8656	2 51 30.6	13.067
12	21 15 23.97	2.0634	12 51 18.3	12.100	12	22 48 58.51	1.8631	2 38 27.2	13.068
13	21 17 27.60	2.0576	12 39 10.9	12.146	13	22 50 50.23	1.8607	2 25 23.9	13.063
14	21 19 30.88	2.0518	12 27 0.9	12.188	14	22 52 41.80	1.8584	2 12 20.8	13.059
15	21 21 33.82	2.0461	12 14 48.3	12.231	15	22 54 33.24	1.8562	1 59 17.9	13.047
16	21 23 36.42	2.0405	12 2 33.2	12.272	16	22 56 24.55	1.8540	1 46 15.2	13.043
17	21 25 38.69	2.0350	11 50 15.6	12.312	17	22 58 15.73	1.8519	1 33 12.8	13.037
18	21 27 40.63	2.0296	11 37 55.7	12.352	18	23 0 6.78	1.8499	1 20 10.8	13.029
19	21 29 42.24	2.0244	11 25 33.4	12.390	19	23 1 57.72	1.8480	1 7 9.2	13.023
20	21 31 43.52	2.0187	11 13 8.9	12.427	20	23 3 48.54	1.8460	0 54 8.0	13.016
21	21 33 44.49	2.0136	11 0 42.2	12.463	21	23 5 39.25	1.8442	0 41 7.3	13.008
22	21 35 45.14	2.0082	10 48 13.5	12.497	22	23 7 29.85	1.8426	0 28 7.0	13.000
23	21 37 45.48	2.0031	S. 10° 35' 42.7"	12.529	23	23 9 20.36	1.8410	S. 0° 15' 7.3"	13.990
WEDNESDAY 26.					FRIDAY 28.				
0	21 39 45.52	1.9980	S. 10° 23' 10.0"	12.561	0	23 11 10.77	1.8394	S. 0° 2' 8.2"	13.979
1	21 41 45.25	1.9930	10 10 35.4	12.592	1	23 13 1.09	1.8379	N. 0° 10' 50.2"	13.968
2	21 43 44.68	1.9880	9 57 58.9	12.623	2	23 14 51.32	1.8366	0 23 48.0	13.957
3	21 45 43.82	1.9832	9 45 20.7	12.651	3	23 16 41.47	1.8350	0 36 45.0	13.946
4	21 47 42.67	1.9784	9 32 40.8	12.678	4	23 18 31.53	1.8337	0 49 41.3	13.933
5	21 49 41.23	1.9736	9 19 59.3	12.706	5	23 20 21.52	1.8326	1 2 36.8	13.917
6	21 51 39.51	1.9690	9 7 16.2	12.731	6	23 22 11.44	1.8314	1 15 31.4	13.902
7	21 53 37.51	1.9644	8 54 31.6	12.755	7	23 24 1.29	1.8303	1 28 25.1	13.886
8	21 55 35.24	1.9600	8 41 45.6	12.778	8	23 25 51.08	1.8293	1 41 17.9	13.873
9	21 57 32.71	1.9556	8 28 58.2	12.801	9	23 27 40.81	1.8284	1 54 9.7	13.858
10	21 59 29.91	1.9510	8 16 9.5	12.822	10	23 29 30.49	1.8276	2 7 0.5	13.846
11	22 1 26.84	1.9466	8 3 19.5	12.843	11	23 31 20.12	1.8269	2 19 50.3	13.831
12	22 3 23.51	1.9423	7 50 28.3	12.862	12	23 33 9.70	1.8260	2 32 39.0	13.803
13	22 5 19.94	1.9384	7 37 36.0	12.881	13	23 34 59.24	1.8256	2 45 26.6	13.784
14	22 7 16.12	1.9343	7 24 42.6	12.898	14	23 36 48.75	1.8248	2 58 13.0	13.764
15	22 9 12.06	1.9303	7 11 48.2	12.914	15	23 38 38.22	1.8242	3 10 58.3	13.744
16	22 11 7.76	1.9265	6 58 52.9	12.930	16	23 40 27.66	1.8237	3 23 42.3	13.723
17	22 13 3.23	1.9228	6 45 56.6	12.945	17	23 42 17.07	1.8233	3 36 25.0	13.701
18	22 14 58.47	1.9187	6 32 59.5	12.960	18	23 44 6.46	1.8221	3 49 6.4	13.678
19	22 16 53.48	1.9150	6 20 1.6	12.971	19	23 45 55.85	1.8220	4 1 46.4	13.656
20	22 18 48.27	1.9114	6 7 3.0	12.983	20	23 47 45.23	1.8222	4 14 25.1	13.633
21	22 20 42.85	1.9078	5 54 3.7	12.993	21	23 49 34.60	1.8227	4 27 2.3	13.608
22	22 22 37.21	1.9042	5 41 3.8	13.008	22	23 51 23.96	1.8226	4 39 38.1	13.583
23	22 24 31.36	1.9018	5 28 3.3	13.013	23	23 53 13.31	1.8226	4 52 12.3	13.558
24	22 26 25.31	1.8976	S. 5° 15' 2.2"	13.022	24	23 55 2.66	1.8226	N. 5° 4' 45.1"	13.533

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 29.					SUNDAY 30.				
0	^h 23 ^m 55 ^s 2.66	1.82226	N. 5° 4' 45.1"	12.533	0	^h 0 38 ^m 58.96	1.8450	N. 9° 56' 30.4"	11.721
1	23 56 52.03	1.82239	5 17 16.3	12.506	1	0 40 49.71	1.8467	10 8 12.4	11.679
2	23 58 41.41	1.82261	5 29 45.8	12.477	2	0 42 40.57	1.8485	10 19 51.9	11.637
3	0 0 30.81	1.82285	5 42 13.6	12.450	3	0 44 31.53	1.8503	10 31 28.9	11.596
4	0 2 20.22	1.82308	5 54 39.8	12.423	4	0 46 22.61	1.8523	10 43 3.3	11.552
5	0 4 9.66	1.82343	6 7 4.2	12.392	5	0 48 13.80	1.8541	10 54 35.1	11.507
6	0 5 59.13	1.82348	6 19 26.9	12.363	6	0 50 5.11	1.8563	11 6 4.2	11.463
7	0 7 48.64	1.82354	6 31 47.8	12.333	7	0 51 56.55	1.8563	11 17 30.7	11.418
8	0 9 38.18	1.82359	6 44 6.8	12.301	8	0 53 48.11	1.8564	11 28 54.4	11.372
9	0 11 27.76	1.82365	6 56 23.9	12.269	9	0 55 39.80	1.8565	11 40 15.4	11.326
10	0 13 17.39	1.82374	7 8 39.1	12.237	10	0 57 31.62	1.8566	11 51 33.5	11.277
11	0 15 7.07	1.82383	7 20 52.3	12.204	11	0 59 23.58	1.8571	12 2 48.7	11.230
12	0 16 56.79	1.82391	7 33 3.6	12.173	12	1 1 15.68	1.8595	12 14 1.1	11.182
13	0 18 46.57	1.82398	7 45 12.9	12.137	13	1 3 7.92	1.8719	12 25 10.5	11.133
14	0 20 36.42	1.82412	7 57 20.1	12.103	14	1 5 0.31	1.8744	12 36 17.0	11.082
15	0 22 26.33	1.82328	8 9 25.2	12.067	15	1 6 52.85	1.8769	12 47 20.4	11.032
16	0 24 16.30	1.82344	8 21 28.1	12.031	16	1 8 45.54	1.8796	12 58 20.8	10.980
17	0 26 6.34	1.82346	8 33 28.9	11.995	17	1 10 38.39	1.8921	13 9 18.0	10.928
18	0 27 56.46	1.82360	8 45 27.5	11.967	18	1 12 31.40	1.8948	13 20 12.2	10.876
19	0 29 46.66	1.82373	8 57 23.8	11.939	19	1 14 24.57	1.8976	13 31 3.2	10.823
20	0 31 36.94	1.82387	9 9 17.8	11.911	20	1 16 17.90	1.8998	13 41 51.0	10.770
21	0 33 27.31	1.82401	9 21 9.5	11.883	21	1 18 11.41	1.8933	13 52 35.6	10.716
22	0 35 17.76	1.82417	9 32 58.9	11.855	22	1 20 5.09	1.8960	14 3 16.8	10.659
23	0 37 8.31	1.82433	9 44 45.9	11.763	23	1 21 58.94	1.8990	14 13 54.7	10.604
24	0 38 58.96	1.82450	N. 9° 56' 30.4"	11.731	24	1 23 52.98	1.9023	N. 14° 24' 29.2"	10.548

PHASES OF THE MOON.

● New Moon,	^d 8 ^h 1 ^m 33.3
☾ First Quarter,	15 10 16.3
○ Full Moon,	22 2 23.2
☾ Last Quarter,	29 14 40.7

☾ Apogee,	^d 3 ^h 10.0
☾ Perigee,	19 4.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Antares W.	105° 13' 59"	3026	106° 43' 37"	3034	108° 13' 7"	3041	109° 42' 29"	3047
	α Aquilæ W.	55 36 15	3040	56 50 30	3034	58 5 7	3006	59 20 3	3766
	α Arietis E.	42 51 52	3086	41 23 1	3074	39 54 20	3082	38 25 49	3081
	SUN E.	78 10 30	3393	76 48 6	3400	75 25 50	3403	74 3 42	3414
2	Antares W.	117 7 45	3060	118 36 32	3073	120 5 16	3075	121 33 56	3077
	α Aquilæ W.	65 38 53	3718	66 55 21	3707	68 12 1	3096	69 28 52	3097
	Fomalhaut W.	41 31 10	4160	42 40 15	4108	43 50 14	4050	45 1 4	4084
	α Arietis E.	31 5 56	3196	29 38 30	3147	28 11 16	3158	26 44 14	3170
	SUN E.	67 14 37	3438	65 53 3	3441	64 31 33	3445	63 10 7	3446
3	α Aquilæ W.	75 55 29	3646	77 13 14	3638	78 31 7	3633	79 49 6	3636
	Fomalhaut W.	51 5 43	3819	52 20 26	3789	53 35 40	3763	54 51 21	3737
	α Pegasi W.	28 13 1	3773	29 28 32	3719	30 45 8	3656	32 2 40	3610
	SUN E.	56 23 25	3462	55 2 7	3462	53 40 49	3462	52 19 31	3466
4	α Aquilæ W.	86 20 37	3800	87 39 11	3804	88 57 50	3892	90 16 33	3896
	Fomalhaut W.	61 16 0	3831	62 34 1	3613	63 52 22	3695	65 11 2	3679
	α Pegasi W.	38 41 28	3440	40 2 59	3415	41 24 59	3393	42 47 25	3369
	SUN E.	45 32 33	3440	44 11 2	3437	42 49 27	3434	41 27 49	3431
5	α Aquilæ W.	96 51 2	3876	98 10 3	3876	99 29 5	3873	100 48 9	3873
	Fomalhaut W.	71 48 33	3606	73 8 50	3494	74 29 21	3483	75 50 5	3476
	α Pegasi W.	49 45 23	3279	51 9 59	3263	52 34 54	3249	54 0 5	3235
	SUN E.	34 38 29	3408	33 16 22	3403	31 54 8	3396	30 31 49	3393
10	SUN W.	22 27 20	3073	23 56 2	3063	25 24 58	3061	26 54 8	3060
	Jupiter E.	39 47 56	3797	38 13 24	3793	36 38 45	3785	35 3 57	3779
	Regulus E.	45 55 59	3740	44 20 12	3733	42 44 14	3726	41 8 7	3717
	Saturn E.	51 52 30	3275	50 17 29	3268	48 42 19	3261	47 7 0	3256
	Spica E.	99 56 30	3734	98 20 22	3716	96 44 2	3706	95 7 30	3697
11	SUN W.	34 23 23	2966	35 53 54	2976	37 24 38	2966	38 55 35	2964
	Jupiter E.	27 8 12	3768	25 32 49	3766	23 57 24	3766	22 21 59	3760
	Regulus E.	33 5 16	3687	31 28 18	3681	29 51 13	3676	28 14 1	3673
	Saturn E.	39 8 23	3736	37 32 18	3723	35 56 7	3718	34 19 51	3716
	Spica E.	87 1 53	3633	85 24 10	3644	83 46 15	3635	82 8 8	3636
12	SUN W.	46 33 30	2905	48 5 42	2894	49 38 8	2884	50 10 47	2874
	Mars W.	22 29 12	3795	24 3 46	3785	25 38 34	3776	27 13 34	3766
	Saturn E.	26 18 6	3730	24 41 53	3729	23 5 51	3740	21 30 4	3767
	Spica E.	73 54 33	3683	72 15 14	3674	70 35 43	3664	68 55 59	3656
	Antares E.	119 33 52	3677	117 54 26	3669	116 14 48	3659	114 34 56	3651
13	SUN W.	58 57 11	2826	60 31 5	2816	62 5 13	2806	63 39 34	2796
	Mars W.	35 11 47	3717	36 48 4	3707	38 24 35	3698	40 1 18	3689
	Spica E.	60 34 21	3613	58 53 25	3604	57 12 17	3595	55 30 57	3587
	Antares E.	106 12 34	3606	104 31 28	3486	102 50 9	3487	101 8 38	3477
14	SUN W.	71 34 32	2747	73 10 10	2737	74 46 2	2727	76 22 7	2716
	Mars W.	48 8 8	3640	49 46 9	3630	51 24 23	3621	53 2 50	3611
	Spica E.	47 1 15	3444	45 18 43	3436	43 35 58	3427	41 53 2	3419
	Antares E.	92 37 48	3433	90 54 59	3424	89 11 58	3415	87 28 44	3406
15	SUN W.	84 25 44	2669	86 3 6	2659	87 40 41	2649	89 18 29	2640

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Antares W.	111° 11' 44"	3069	119° 40' 53"	3066	114° 9' 56"	3061	115° 38' 53"	3066
	α Aquilæ W.	60 35 18	3773	61 50 49	3787	63 6 36	3744	64 22 37	3729
	α Arietis E.	36 57 29	3101	35 29 20	3110	34 1 22	3118	32 33 34	3126
	SUN E.	72 41 41	3439	71 19 47	3436	69 57 59	3430	68 36 16	3423
2	Antares W.	123 2 34	3079	124 31 9	3081	125 59 42	3081	127 28 15	3083
	α Aquilæ W.	70 45 53	3677	72 3 4	3689	73 20 24	3682	74 37 52	3653
	Fomalhaut W.	46 12 40	3061	47 24 58	3030	48 37 57	3065	49 51 32	3060
	α Arietis E.	25 17 26	3180	23 50 53	3198	22 24 36	3210	20 58 39	3228
	SUN E.	61 48 43	3446	60 27 21	3460	59 6 1	3452	57 44 43	3453
3	α Aquilæ W.	81 7 13	3021	82 25 25	3018	83 43 43	3009	85 2 8	3006
	Fomalhaut W.	56 7 29	3713	57 24 2	3691	58 40 59	3669	59 58 19	3649
	α Pegasi W.	33 21 4	3089	34 40 12	3092	36 0 1	3497	37 20 28	3468
	SUN E.	50 58 11	3449	49 36 49	3447	48 15 26	3446	46 54 1	3443
4	α Aquilæ W.	91 35 20	3066	92 54 11	3063	94 13 5	3078	95 32 3	3077
	Fomalhaut W.	66 29 59	3699	67 49 14	3646	69 8 45	3636	70 28 31	3620
	α Pegasi W.	44 10 17	3249	45 33 32	3231	46 57 8	3212	48 21 6	3206
	SUN E.	40 6 7	3436	38 44 20	3423	37 22 28	3417	36 0 31	3413
5	α Aquilæ W.	102 7 13	3078	103 26 17	3076	104 45 19	3076	106 4 21	3077
	Fomalhaut W.	77 11 3	3450	78 32 13	3448	79 53 35	3438	81 15 9	3426
	α Pegasi W.	55 25 33	3221	56 51 17	3208	58 17 17	3193	59 43 34	3181
	SUN E.	29 9 23	3267	27 46 52	3261	26 24 14	3276	25 1 30	3270
10	SUN W.	28 23 32	3029	29 53 9	3018	31 23 0	3007	32 53 5	2996
	Jupiter E.	33 29 1	2773	31 53 58	2766	30 18 48	2764	28 43 33	2760
	Regulus E.	39 31 50	2710	37 55 24	2704	36 18 50	2698	34 42 7	2692
	Saturn E.	45 31 33	2748	43 55 57	2742	42 20 13	2736	40 44 21	2732
	Spica E.	93 30 46	2668	91 53 50	2679	90 16 42	2671	88 39 24	2662
11	SUN W.	40 26 45	2945	41 58 7	2935	43 29 42	2925	45 1 29	2914
	Jupiter E.	20 46 39	2706	19 11 26	2776	17 36 26	2791	16 1 46	2811
	Regulus E.	26 36 45	2673	24 59 27	2670	23 22 7	2671	21 44 48	2674
	Saturn E.	32 43 32	2713	31 7 10	2712	29 30 46	2713	27 54 24	2716
	Spica E.	80 29 49	2616	78 51 18	2609	77 12 35	2600	75 33 40	2591
12	SUN W.	52 43 39	2866	54 16 44	2856	55 50 0	2845	57 23 29	2836
	Mars W.	28 48 47	2766	30 24 13	2746	31 59 52	2737	33 35 43	2737
	Saturn E.	19 54 40	2780	18 19 46	2814	16 45 36	2861	15 12 27	2927
	Spica E.	67 16 4	2648	65 35 57	2639	63 55 37	2629	62 15 5	2621
	Antares E.	112 54 53	2641	111 14 37	2633	109 34 9	2622	107 53 27	2615
13	SUN W.	65 14 8	2786	66 48 55	2776	68 23 54	2766	69 59 7	2756
	Mars W.	41 38 13	2678	43 15 22	2696	44 52 45	2659	46 30 20	2649
	Spica E.	53 49 25	2478	52 7 41	2469	50 25 44	2461	48 43 36	2452
	Antares E.	99 26 53	2466	97 44 55	2460	96 2 46	2450	94 20 23	2442
14	SUN W.	77 58 25	2707	79 34 56	2696	81 11 39	2689	82 48 35	2678
	Mars W.	54 41 30	2601	56 20 23	2608	57 59 28	2683	59 38 46	2674
	Spica E.	40 9 55	2412	38 26 37	2403	36 43 7	2396	34 59 27	2389
	Antares E.	85 45 17	2396	84 1 37	2386	82 17 45	2376	80 33 39	2370
15	SUN W.	90 56 30	2630	92 34 44	2621	94 13 10	2612	95 51 49	2604

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
15	Mars W.	61° 18' 17"	2544	62° 58' 2"	2555	64° 37' 59"	2545	66° 18' 9"	2587
	Jupiter W.	26 46 1	2465	28 28 4	2460	30 10 28	2436	31 53 11	2423
	Regulus W.	21 25 24	2436	23 8 8	2419	24 51 15	2404	26 34 44	2389
	Saturn W.	15 56 30	2389	17 33 52	2310	19 13 34	2368	20 52 20	2325
	Spica E.	33 15 37	2383	31 31 38	2376	29 47 29	2371	28 3 12	2364
	Antares E.	78 49 21	2361	77 4 50	2363	75 20 7	2343	73 35 10	2326
16	SUN W.	97 30 39	2584	99 9 42	2585	100 48 57	2577	102 28 24	2568
	Mars W.	74 42 7	2493	76 23 31	2483	78 5 8	2475	79 46 57	2467
	Jupiter W.	40 31 7	2387	42 15 29	2357	44 0 6	2346	45 44 56	2337
	Regulus W.	35 17 27	2323	37 2 54	2313	38 48 36	2302	40 34 32	2288
	Saturn W.	29 22 4	2408	31 5 35	2385	32 49 31	2370	34 33 49	2355
	Antares E.	64 47 18	2323	63 1 7	2284	61 14 44	2277	59 28 11	2266
	α Aquilæ E.	116 1 54	2368	114 30 49	2381	112 59 10	2306	111 26 58	2283
17	SUN W.	110 48 30	2629	112 29 3	2623	114 9 46	2615	115 50 39	2607
	Mars W.	88 18 47	2436	90 1 42	2421	91 44 47	2415	93 28 1	2406
	Jupiter W.	54 32 23	2397	56 18 27	2389	58 4 43	2382	59 51 9	2375
	Regulus W.	49 27 39	2349	51 14 54	2341	53 2 20	2334	54 49 57	2327
	Saturn W.	43 20 0	2398	45 6 3	2389	46 52 19	2379	48 38 49	2371
	Antares E.	50 32 31	2333	48 44 52	2225	46 57 2	2219	45 9 4	2212
	α Aquilæ E.	103 39 18	2793	102 4 39	2777	100 29 41	2763	98 54 25	2753
18	SUN W.	124 17 14	2480	125 58 55	2475	127 40 43	2470	129 22 38	2465
	Mars W.	102 6 17	2381	103 50 19	2376	105 34 28	2372	107 18 43	2368
	Jupiter W.	68 45 39	2246	70 32 58	2242	72 20 23	2236	74 7 54	2232
	Regulus W.	63 50 26	2198	65 38 57	2193	67 27 35	2188	69 16 20	2184
	Saturn W.	57 34 8	2337	59 21 41	2331	61 9 22	2326	62 57 11	2323
	Antares E.	36 7 5	2188	34 18 20	2184	32 29 28	2181	30 40 32	2177
	α Aquilæ E.	90 54 51	2713	89 18 28	2708	87 41 59	2707	86 5 28	2706
19	Mars W.	116 1 8	2356	117 45 46	2355	119 30 26	2354	121 15 7	2353
	Jupiter W.	83 6 48	2230	84 54 46	2219	86 42 45	2216	88 30 46	2215
	Regulus W.	78 21 24	2171	80 10 35	2169	81 59 49	2169	83 49 4	2169
	Saturn W.	71 57 42	2206	73 46 0	2204	75 34 21	2203	77 22 44	2203
	Spica W.	24 21 2	2194	26 9 39	2190	27 58 22	2186	29 47 10	2184
	α Aquilæ E.	78 3 4	2730	76 26 51	2728	74 50 48	2737	73 14 57	2747
	Fomalhaut E.	102 57 32	2609	101 18 49	2601	99 39 56	2596	98 0 55	2591
20	Jupiter W.	97 30 30	2236	99 18 19	2229	101 6 3	2223	102 53 43	2225
	Regulus W.	92 55 8	2174	94 44 15	2177	96 33 17	2180	98 22 14	2184
	Saturn W.	86 24 32	2206	88 12 48	2211	90 0 59	2214	91 49 5	2216
	Spica E.	38 51 57	2179	40 40 56	2181	42 29 52	2182	44 18 46	2186
	α Aquilæ E.	65 20 3	2633	63 46 17	2636	62 13 2	2633	60 40 21	2612
	Fomalhaut E.	89 45 4	2691	88 5 57	2695	86 26 55	2699	84 47 59	2695
	α Pegasi E.	110 45 22	2323	108 59 56	2323	107 14 29	2323	105 29 3	2324
21	Jupiter W.	111 50 22	2264	113 37 14	2271	115 23 56	2279	117 10 26	2286
	Regulus W.	107 25 16	2212	109 13 26	2218	111 1 26	2227	112 49 14	2234
	Saturn W.	100 47 55	2245	102 35 15	2253	104 22 23	2260	105 9 21	2269
	Spica W.	53 21 51	2208	55 10 6	2215	56 58 11	2223	58 46 6	2230
	α Aquilæ E.	53 7 47	3116	51 39 57	3170	50 13 12	3231	48 47 37	3295
	Fomalhaut E.	76 36 0	2657	74 58 22	2672	73 21 4	2686	71 44 8	2705
	α Pegasi E.	96 42 36	2341	94 57 36	2347	93 12 45	2355	91 28 5	2362

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	Mars W.	67° 58' 31"	2327	69° 39' 6"	2313	71° 19' 54"	2310	73° 0' 54"	2300
	Jupiter W.	33 36 13	2411	35 19 32	2399	37 3 8	2398	38 47 0	2378
	Regulus W.	28 18 35	2373	30 2 49	2369	31 47 23	2346	33 32 16	2333
	Saturn W.	22 32 58	2493	24 14 21	2465	25 56 23	2441	27 38 59	2421
	Spica E.	26 18 46	2361	24 34 15	2337	22 49 38	2354	21 4 57	2344
	Antares E.	71 50 1	2326	70 4 39	2317	68 19 4	2309	66 33 17	2300
16	SUN W.	104 8 3	2500	105 47 54	2551	107 27 56	2544	109 8 8	2537
	Mars W.	81 28 57	2469	83 11 8	2461	84 53 30	2443	86 36 3	2436
	Jupiter W.	47 30 1	2329	49 15 18	2320	51 0 48	2312	52 46 30	2304
	Regulus W.	42 20 42	2263	44 7 7	2274	45 53 45	2265	47 40 36	2257
	Saturn W.	36 18 28	2343	38 3 25	2331	39 48 40	2319	41 34 12	2306
	Antares E.	57 41 25	2261	55 54 28	2263	54 7 20	2246	52 20 1	2239
	α Aquilæ E.	109 54 17	2392	108 21 9	2342	106 47 35	2322	105 13 37	2307
17	SUN W.	117 31 42	2501	119 12 54	2496	120 54 13	2490	122 35 40	2485
	Mars W.	95 11 24	2403	96 54 55	2397	98 38 34	2391	100 22 22	2386
	Jupiter W.	61 37 45	2298	63 24 31	2283	65 11 25	2257	66 58 28	2251
	Regulus W.	56 37 45	2221	58 25 41	2214	60 13 47	2208	62 2 2	2202
	Saturn W.	50 25 31	2263	52 12 25	2256	53 59 29	2249	55 46 44	2243
	Antares E.	43 20 56	2208	41 32 40	2202	39 44 16	2197	37 55 44	2192
	α Aquilæ E.	97 18 54	2741	95 43 9	2733	94 7 13	2726	92 31 6	2719
18	SUN W.	131 4 39	2492	132 46 45	2486	134 28 54	2480	136 11 6	2466
	Mars W.	109 3 4	2385	110 47 29	2362	112 31 59	2350	114 16 32	2337
	Jupiter W.	75 55 32	2230	77 43 15	2227	79 31 2	2225	81 18 53	2222
	Regulus W.	71 5 12	2180	72 54 9	2177	74 43 11	2176	76 32 16	2173
	Saturn W.	64 45 6	2218	66 33 7	2214	68 21 14	2210	70 9 26	2206
	Antares E.	28 51 30	2175	27 2 25	2173	25 13 17	2172	23 24 7	2166
	α Aquilæ E.	84 28 56	2707	82 52 25	2707	81 15 54	2709	79 39 26	2713
19	Mars W.	122 59 49	2354	124 44 30	2355	126 29 9	2357	128 13 46	2359
	Jupiter W.	90 18 45	2219	92 6 44	2220	93 54 42	2222	95 42 37	2223
	Regulus W.	85 38 18	2169	87 27 32	2170	89 16 45	2170	91 5 57	2171
	Saturn W.	79 11 7	2203	80 59 30	2204	82 47 52	2204	84 36 13	2206
	Spica W.	31 36 2	2181	33 24 58	2179	35 13 57	2178	37 2 58	2179
	α Aquilæ E.	71 39 20	2700	70 4 0	2774	68 28 58	2791	66 54 18	2810
	Fomalhaut E.	96 21 48	2689	94 42 38	2686	93 3 26	2698	91 24 14	2699
20	Jupiter W.	104 41 18	2226	106 28 47	2245	108 16 7	2251	110 3 19	2257
	Regulus W.	100 11 5	2186	101 59 50	2194	103 48 27	2199	105 36 56	2205
	Saturn W.	93 37 5	2223	95 24 59	2227	97 12 46	2233	99 0 25	2239
	Spica W.	46 7 35	2199	47 56 19	2193	49 44 57	2196	51 33 27	2202
	α Aquilæ E.	59 8 18	2346	57 36 57	2391	56 6 21	2392	54 36 37	2397
	Fomalhaut E.	83 9 11	2612	81 30 33	2622	79 52 8	2632	78 13 56	2643
	α Pegasi E.	103 43 38	2236	101 58 15	2327	100 12 55	2332	98 27 42	2337
21	Jupiter W.	118 56 43	2296	120 42 48	2307	122 28 38	2315	124 14 15	2327
	Regulus W.	114 36 51	2243	116 24 14	2252	118 11 24	2262	119 58 20	2271
	Saturn W.	107 56 6	2278	109 42 38	2287	111 28 57	2297	113 15 1	2306
	Spica W.	60 33 49	2226	62 21 20	2245	64 8 40	2255	65 55 46	2264
	α Aquilæ E.	47 23 22	2399	46 0 30	2449	44 39 9	2458	43 19 27	2464
	Fomalhaut E.	70 7 36	2726	68 31 29	2746	66 55 50	2766	65 20 42	2794
	α Pegasi E.	89 43 36	2371	87 59 19	2379	86 15 14	2389	84 31 23	2399

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
22	Saturn W.	115° 0' 49"	2318	116° 46' 22"	2380	118° 31' 36"	2349	120° 16' 36"	2365
	Spica W.	67 42 38	2274	69 29 15	2286	71 15 38	2290	73 1 44	2307
	Antares W.	22 1 50	2276	23 48 26	2285	25 34 48	2296	27 20 54	2307
	Fomalhaut E.	63 46 6	2320	62 12 4	2349	60 38 40	2361	59 5 57	2315
	α Pegasi E.	82 47 47	2410	81 4 27	2423	79 21 23	2435	77 38 38	2448
	α Arietis E.	125 42 20	2392	123 56 9	2301	122 10 11	2311	120 24 28	2322
23	Spica W.	81 47 57	2309	83 32 16	2302	85 16 16	2306	86 59 56	2410
	Antares W.	36 7 19	2266	37 51 43	2280	39 35 47	2293	41 19 32	2408
	Fomalhaut E.	51 34 12	3129	50 6 38	3183	48 40 8	3241	47 14 47	3306
	α Pegasi E.	69 9 57	2326	67 29 20	2343	65 49 7	2363	64 9 21	2362
	α Arietis E.	111 39 59	2381	109 55 57	2394	108 12 14	2408	106 28 51	2423
24	Spica W.	95 33 7	2488	97 14 41	2500	98 55 54	2517	100 36 44	2522
	Antares W.	49 53 9	2481	51 34 49	2497	53 16 7	2513	54 57 4	2527
	Fomalhaut E.	40 28 30	3723	39 12 6	3681	37 57 36	3664	36 45 11	4090
	α Pegasi E.	55 57 25	2691	54 20 33	2716	52 44 15	2742	51 8 31	2767
	α Arietis E.	97 57 2	2496	96 15 43	2511	94 34 45	2527	92 54 9	2543
25	Spica W.	108 55 25	2613	110 34 2	2629	112 12 17	2645	113 50 11	2661
	Antares W.	63 16 22	2607	64 55 8	2624	66 33 31	2639	68 11 33	2666
	Fomalhaut E.	31 20 33	5076	30 24 36	5061	29 32 13	5092	28 43 41	5077
	α Arietis E.	84 36 36	2623	82 58 12	2630	81 20 10	2655	79 42 29	2671
26	Antares W.	76 16 23	2733	77 52 19	2746	79 27 55	2763	81 3 11	2779
	α Arietis E.	71 39 30	2760	70 3 57	2766	68 28 45	2792	66 53 54	2798
	Aldebaran E.	104 20 10	2733	102 45 20	2797	101 10 48	2813	99 36 36	2827
	SUN E.	130 56 0	3068	129 27 11	3064	127 58 42	3101	126 30 33	3116
27	Antares W.	88 54 43	2848	90 28 7	2863	92 1 14	2876	93 34 4	2889
	α Aquilæ W.	42 44 52	4168	43 53 34	4122	45 3 14	4098	46 13 47	4020
	α Arietis E.	59 4 33	2871	57 31 37	2886	55 59 0	2900	54 26 41	2913
	Aldebaran E.	91 50 13	2997	90 17 50	2910	88 45 44	2923	87 13 54	2936
	SUN E.	119 14 32	3193	117 48 13	3207	116 22 12	3222	114 56 29	3236
28	Antares W.	101 14 18	2947	102 45 37	2968	104 16 43	2988	105 47 36	2977
	α Aquilæ W.	52 16 50	3848	53 31 3	3823	54 45 42	3799	56 0 45	3781
	Fomalhaut W.	30 43 50	5339	31 36 29	5143	32 31 34	4973	33 28 51	4823
	α Arietis E.	46 49 18	2976	45 18 38	2990	43 48 13	3002	42 18 3	3014
	Aldebaran E.	79 38 39	2996	78 8 21	3007	76 38 17	3018	75 8 26	3027
	SUN E.	107 51 45	3299	106 27 32	3309	105 3 31	3319	103 39 42	3331
29	Antares W.	113 19 17	3018	114 49 7	3036	116 18 48	3053	117 48 21	3069
	α Aquilæ W.	62 20 24	3708	63 37 3	3697	64 53 53	3687	66 10 54	3678
	Fomalhaut W.	38 41 53	4808	39 48 43	4320	40 56 41	4166	42 5 40	4106
	α Arietis E.	34 50 50	3073	33 22 6	3084	31 53 37	3096	30 25 22	3106
	Aldebaran E.	67 42 11	3074	66 13 30	3083	64 44 59	3091	63 16 38	3099
	SUN E.	96 43 30	3376	95 20 46	3368	93 58 10	3391	92 35 43	3397
30	α Aquilæ W.	72 38 7	3644	73 55 54	3638	75 13 47	3633	76 31 46	3636
	Fomalhaut W.	48 3 3	3899	49 16 34	3866	50 30 40	3826	51 45 16	3796
	α Pegasi W.	25 5 47	3641	26 18 25	3666	27 32 30	3704	28 47 49	3723
	Aldebaran E.	55 57 6	3189	54 29 35	3196	53 2 12	3149	51 34 55	3148
	SUN E.	85 45 5	3423	84 23 13	3426	83 1 25	3429	81 39 41	3431

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	Saturn W.	122° 1' 16"	2800	123° 45' 37"	2892	125° 29' 38"	2896	127° 13' 13"	2910
	Spica W.	74 47 34	2819	76 33 6	2831	78 18 21	2842	80 3 19	2856
	Antares W.	29 6 44	2817	30 52 18	2828	32 37 36	2840	34 22 37	2853
	Fomalhaut E.	57 33 57	2851	56 2 43	2887	54 32 19	2933	53 2 47	2979
	α Pegasi E.	75 56 12	2402	74 14 6	2477	72 32 20	2493	70 50 57	2510
	α Arietis E.	118 39 0	2838	116 53 49	2846	115 8 55	2857	113 24 18	2868
23	Spica W.	88 43 16	2426	90 26 15	2428	92 8 54	2454	93 51 12	2470
	Antares W.	43° 2' 56"	2422	44 46 0	2436	46 28 43	2450	48 11 7	2466
	Fomalhaut E.	45 50 40	2873	44 27 53	2448	43 6 31	2631	41 46 41	2622
	α Pegasi E.	62 30 1	2601	60 51 8	2623	59 12 43	2644	57 34 48	2668
	α Arietis E.	104 45 49	2426	103 3 6	2450	101 20 43	2466	99 38 42	2481
24	Spica W.	102 17 13	2646	103 57 19	2664	105 37 3	2680	107 16 25	2696
	Antares W.	56 37 40	2643	58 17 54	2659	59 57 45	2674	61 37 15	2691
	Fomalhaut E.	35 35 0	4244	34 27 15	4414	33 22 6	4608	32 19 48	4826
	α Pegasi E.	49 33 20	2797	47 58 48	2828	46 24 56	2857	44 51 42	2889
	α Arietis E.	91 13 55	2646	89 34 2	2674	87 54 31	2690	86 15 22	2697
25	Spica W.	115 27 43	2678	117 4 53	2692	118 41 42	2709	120 18 10	2728
	Antares W.	69 49 13	2671	71 26 32	2687	73 3 30	2702	74 40 7	2718
	Fomalhaut E.	27 59 16	6829	27 19 14	7063	26 43 50	7719	26 13 20	8610
	α Arietis E.	78 5 10	2698	76 28 14	2704	74 51 39	2719	73 15 24	2735
26	Antares W.	82 38 7	2798	84 12 44	2808	85 47 2	2822	87 21 1	2835
	α Arietis E.	65 19 23	2613	63 45 12	2626	62 11 21	2642	60 37 48	2656
	Aldebaran E.	96 2 43	2642	96 29 9	2658	94 55 52	2689	93 22 53	2698
	SUN E.	125 2 43	3122	123 35 12	3148	122 8 0	3163	120 41 7	3178
27	Antares W.	95 6 37	2801	96 38 55	2812	98 10 57	2824	99 42 45	2836
	α Aquilæ W.	47 25 7	2677	48 37 9	2689	49 49 49	2695	51 3 4	2674
	α Arietis E.	52 54 39	2927	51 22 54	2940	49 51 26	2953	48 20 14	2966
	Aldebaran E.	85 42 19	2949	84 11 2	2961	82 40 0	2973	81 9 12	2984
	SUN E.	113 31 2	3247	112 5 49	3261	110 40 52	3276	109 16 11	3288
28	Antares W.	107 18 19	2896	108 48 50	2904	110 19 10	2904	111 49 18	2911
	α Aquilæ W.	57 16 7	2764	58 31 47	2747	59 47 44	2732	61 3 57	2719
	Fomalhaut W.	34 28 9	4891	35 29 16	4676	36 32 2	4474	37 36 17	4284
	α Arietis E.	40 48 8	2626	39 18 27	2687	37 49 0	2649	36 19 48	2600
	Aldebaran E.	73 38 47	2927	72 9 20	2947	70 40 6	2956	69 11 3	2965
	SUN E.	102 16 6	3241	100 52 42	3260	99 29 28	3269	98 6 24	3267
29	Antares W.	119 17 46	2943	120 47 5	2950	122 16 16	2954	123 45 22	2959
	α Aquilæ W.	67 28 4	2670	68 45 23	2663	70 2 50	2656	71 20 25	2649
	Fomalhaut W.	43 15 34	4063	44 26 21	4007	45 37 54	3963	46 50 10	3926
	α Arietis E.	28 57 19	3119	27 29 33	3123	26 2 3	3147	24 34 50	3163
	Aldebaran E.	61 48 27	3108	60 20 24	3113	58 52 30	3119	57 24 44	3126
	SUN E.	91 13 23	2402	89 51 9	2407	88 29 0	2414	87 6 59	2420
30	α Aquilæ W.	77 49 50	2623	79 7 59	2620	80 26 12	2615	81 44 30	2610
	Fomalhaut W.	53 0 22	3770	54 15 55	3746	55 31 53	3723	56 48 16	3702
	α Pegasi W.	30 4 13	2667	31 21 35	2619	32 39 49	2678	33 58 47	2635
	Aldebaran E.	50 7 44	3155	48 40 41	3190	47 13 44	3164	45 46 52	3198
	SUN E.	80 18 0	2483	78 56 21	2424	77 34 43	2434	76 13 5	2426

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		^h ^m ^s	^s	N. [°] ['] ["]	["]	['] ["]	^s	^m ^s	^s
Mon.	1	6 41 34.76	10.338	N. 23 6 48.9	10.27	15 46.14	68.78	3 28.80	0.481
Tues.	2	6 45 42.80	10.328	23 2 30.2	11.28	15 46.13	68.74	3 40.25	0.470
Wed.	3	6 49 50.59	10.317	22 57 47.3	12.29	15 46.12	68.70	3 51.46	0.459
Thur.	4	6 53 58.11	10.305	22 52 40.3	13.29	15 46.12	68.66	4 2.39	0.448
Fri.	5	6 58 5.31	10.292	22 47 9.4	14.28	15 46.13	68.61	4 13.00	0.435
Sat.	6	7 2 12.17	10.278	22 41 14.7	15.27	15 46.15	68.56	4 23.27	0.421
Sun.	7	7 6 18.69	10.263	22 34 56.4	16.25	15 46.17	68.51	4 33.20	0.406
Mon.	8	7 10 24.83	10.246	22 28 14.5	17.23	15 46.19	68.46	4 42.76	0.390
Tues.	9	7 14 30.57	10.229	22 21 9.3	18.19	15 46.22	68.40	4 51.92	0.373
Wed.	10	7 18 35.89	10.211	22 13 40.9	19.15	15 46.26	68.34	5 0.65	0.355
Thur.	11	7 22 40.77	10.192	22 5 49.6	20.10	15 46.30	68.28	5 8.94	0.337
Fri.	12	7 26 45.20	10.174	21 57 35.5	21.04	15 46.34	68.22	5 16.80	0.318
Sat.	13	7 30 49.16	10.154	21 48 58.9	21.98	15 46.39	68.16	5 24.18	0.297
Sun.	14	7 34 52.62	10.133	21 40 0.2	22.90	15 46.45	68.09	5 31.06	0.276
Mon.	15	7 38 55.55	10.111	21 30 39.3	23.83	15 46.51	68.02	5 37.42	0.255
Tues.	16	7 42 57.96	10.089	21 20 56.4	24.73	15 46.58	67.95	5 43.26	0.233
Wed.	17	7 46 59.85	10.067	21 10 51.9	25.63	15 46.65	67.88	5 48.59	0.211
Thur.	18	7 51 1.20	10.044	21 0 25.9	26.52	15 46.72	67.80	5 53.37	0.188
Fri.	19	7 55 1.99	10.021	20 49 38.7	27.40	15 46.80	67.72	5 57.59	0.165
Sat.	20	7 59 2.21	9.998	20 38 30.3	28.28	15 46.88	67.64	6 1.24	0.142
Sun.	21	8 3 1.88	9.974	20 27 1.1	29.14	15 47.07	67.56	6 4.34	0.118
Mon.	22	8 7 0.98	9.950	20 15 11.3	29.98	15 47.16	67.48	6 6.88	0.094
Tues.	23	8 10 59.52	9.927	20 3 1.3	30.83	15 47.25	67.40	6 8.85	0.070
Wed.	24	8 14 57.48	9.903	19 50 31.2	31.66	15 47.24	67.32	6 10.25	0.046
Thur.	25	8 18 54.85	9.879	19 37 41.2	32.49	15 47.34	67.24	6 11.07	0.022
Fri.	26	8 22 51.65	9.855	19 24 31.5	33.31	15 47.44	67.16	6 11.31	0.002
Sat.	27	8 26 47.86	9.831	19 11 2.4	34.11	15 47.54	67.07	6 10.98	0.026
Sun.	28	8 30 43.49	9.807	18 57 14.3	34.90	15 47.64	66.98	6 10.06	0.050
Mon.	29	8 34 38.55	9.782	18 43 7.4	35.67	15 47.75	66.89	6 8.57	0.075
Tues.	30	8 38 33.02	9.757	18 28 41.9	36.44	15 47.86	66.81	6 6.49	0.099
Wed.	31	8 42 26.89	9.733	18 13 58.0	37.20	15 47.98	66.73	6 3.81	0.123
Thur.	32	8 46 20.17	9.708	N. 17 58 56.1	37.95	15 48.10	66.64	6 0.55	0.147

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Mon.	1	^h 6 ^m 41 ^s 34.16	10.338	N. 23° 6' 49.5"	10.27	^m 3 ^s 28.77	0.481	^h 6 ^m 38 ^s 5.39
Tues.	2	6 45 42.17	10.328	23 2 30.9	11.28	3 40.22	0.470	6 42 1.95
Wed.	3	6 49 49.93	10.317	22 57 48.1	12.29	3 51.43	0.459	6 45 58.50
Thur.	4	6 53 57.42	10.305	22 52 41.2	13.29	4 2.36	0.448	6 49 55.06
Fri.	5	6 58 4.59	10.292	22 47 10.4	14.28	4 12.97	0.435	6 53 51.62
Sat.	6	7 2 11.42	10.278	22 41 15.8	15.27	4 23.24	0.421	6 57 48.18
Sun.	7	7 6 17.91	10.263	22 34 57.6	16.25	4 33.17	0.406	7 1 44.74
Mon.	8	7 10 24.02	10.246	22 28 15.8	17.23	4 42.73	0.390	7 5 41.29
Tues.	9	7 14 29.74	10.229	22 21 10.8	18.19	4 51.89	0.373	7 9 37.85
Wed.	10	7 18 35.03	10.211	22 13 42.6	19.15	5 0.62	0.355	7 13 34.41
Thur.	11	7 22 39.88	10.192	22 5 51.5	20.10	5 8.91	0.337	7 17 30.97
Fri.	12	7 26 44.29	10.174	21 57 37.5	21.04	5 16.77	0.318	7 21 27.52
Sat.	13	7 30 48.23	10.154	21 49 1.0	21.98	5 24.15	0.297	7 25 24.08
Sun.	14	7 34 51.67	10.133	21 40 2.4	22.90	5 31.03	0.276	7 29 20.64
Mon.	15	7 38 54.59	10.111	21 30 41.6	23.83	5 37.39	0.255	7 33 17.20
Tues.	16	7 42 56.99	10.089	21 20 58.8	24.73	5 43.23	0.233	7 37 13.76
Wed.	17	7 46 58.87	10.067	21 10 54.4	25.63	5 48.56	0.211	7 41 10.31
Thur.	18	7 51 0.21	10.044	21 0 28.5	26.52	5 53.34	0.188	7 45 6.87
Fri.	19	7 55 0.99	10.021	20 49 41.4	27.40	5 57.56	0.165	7 49 3.43
Sat.	20	7 59 1.21	9.998	20 38 33.2	28.28	6 1.23	0.142	7 52 59.98
Sun.	21	8 3 0.88	9.974	20 27 4.1	29.14	6 4.34	0.118	7 56 56.54
Mon.	22	8 6 59.98	9.950	20 15 14.4	29.98	6 6.88	0.094	8 0 53.10
Tues.	23	8 10 58.51	9.927	20 3 4.5	30.83	6 8.85	0.070	8 4 49.66
Wed.	24	8 14 56.46	9.903	19 50 34.5	31.66	6 10.25	0.046	8 8 46.21
Thur.	25	8 18 53.84	9.879	19 37 44.6	32.49	6 11.07	0.022	8 12 42.77
Fri.	26	8 22 50.64	9.855	19 24 35.0	33.31	6 11.31	0.002	8 16 39.33
Sat.	27	8 26 46.86	9.831	19 11 6.0	34.11	6 10.98	0.026	8 20 35.88
Sun.	28	8 30 42.50	9.807	18 57 17.9	34.90	6 10.06	0.050	8 24 32.44
Mon.	29	8 34 37.58	9.782	18 43 11.0	35.67	6 8.59	0.075	8 28 28.99
Tues.	30	8 38 32.05	9.757	18 28 45.6	36.44	6 6.50	0.099	8 32 25.55
Wed.	31	8 42 25.93	9.733	18 14 1.8	37.20	6 3.82	0.123	8 36 22.11
Thur.	32	8 46 19.22	9.708	N. 17° 58' 59.9"	37.95	6 0.56	0.147	8 40 18.66

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	182	99° 33' 19.8	32' 37.6	143.01	+0.90	0.0072258	2.0	17 19 3.92	
2	183	100 30 32.0	29 49.6	143.02	0.85	.0072294	1.0	17 15 8.01	
3	184	101 27 44.4	27 1.8	143.03	0.79	.0072307	0.0	17 11 12.09	
4	185	102 24 57.1	24 14.4	143.04	0.70	.0072296	1.0	17 7 16.18	
5	186	103 22 10.1	21 27.2	143.04	0.59	.0072259	2.1	17 3 20.27	
6	187	104 19 23.4	18 40.3	143.05	0.46	.0072196	3.2	16 59 24.36	
7	188	105 16 36.8	15 53.5	143.06	0.33	.0072106	4.3	16 55 28.45	
8	189	106 13 50.5	13 7.1	143.07	0.20	.0071989	5.4	16 51 32.53	
9	190	107 11 4.3	10 20.8	143.08	+0.08	.0071847	6.5	16 47 36.62	
10	191	108 8 18.2	7 34.5	143.08	-0.03	.0071679	7.6	16 43 40.71	
11	192	109 5 32.1	4 48.2	143.08	0.12	.0071486	8.5	16 39 44.80	
12	193	110 2 46.1	2 2.0	143.08	0.17	.0071268	9.5	16 35 48.89	
13	194	110 60 0.2	59 15.9	143.09	0.20	.0071026	10.4	16 31 52.97	
14	195	111 57 14.5	56 30.1	143.10	0.21	.0070764	11.3	16 27 57.06	
15	196	112 54 28.8	53 44.2	143.10	0.20	.0070481	12.2	16 24 1.15	
16	197	113 51 43.3	50 58.5	143.11	0.16	.0070177	13.0	16 20 5.24	
17	198	114 48 58.0	48 13.0	143.12	-0.08	.0069853	13.7	16 16 9.33	
18	199	115 46 13.0	45 27.9	143.13	+0.02	.0069512	14.4	16 12 13.41	
19	200	116 43 28.3	42 43.1	143.14	0.13	.0069156	15.1	16 8 17.50	
20	201	117 40 43.9	39 58.5	143.16	0.26	.0068786	15.7	16 4 21.59	
21	202	118 37 59.9	37 14.3	143.18	0.39	.0068403	16.2	16 0 25.68	
22	203	119 35 16.6	34 30.8	143.21	0.52	.0068006	16.8	15 56 29.77	
23	204	120 32 33.9	31 48.0	143.24	0.63	.0067595	17.4	15 52 33.86	
24	205	121 29 51.9	29 5.9	143.27	0.73	.0067170	18.0	15 48 37.95	
25	206	122 27 10.7	26 24.5	143.31	0.82	.0066732	18.6	15 44 42.04	
26	207	123 24 30.5	23 44.1	143.35	0.87	.0066279	19.2	15 40 46.13	
27	208	124 21 51.2	21 4.6	143.39	0.89	.0065812	19.9	15 36 50.22	
28	209	125 19 12.9	18 26.2	143.43	0.88	.0065330	20.5	15 32 54.31	
29	210	126 16 35.6	15 48.8	143.47	0.84	.0064830	21.2	15 28 58.40	
30	211	127 13 59.5	13 12.5	143.52	0.78	.0064310	22.0	15 25 2.49	
31	212	128 11 24.7	10 37.5	143.57	0.70	.0063772	22.9	15 21 6.58	
32	213	129 8 51.1	8 3.8	143.62	+0.58	0.0063214	23.8	15 17 10.67	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	14' 48.1	14' 48.3	54' 12.6	-0.05	54' 13.2	+0.16	h m	m	d
2	14 49.1	14 50.6	54 16.3	+0.35	54 21.7	0.54	19 20.0	1.85	22.9
3	14 52.7	14 55.3	54 29.3	0.72	54 39.0	0.88	20 6.0	1.97	23.9
4	14 58.4	15 2.0	54 50.5	1.02	55 3.5	1.14	20 54.7	2.08	24.9
5	15 5.9	15 10.1	55 17.9	1.24	55 33.3	1.32	21 46.0	2.18	25.9
6	15 14.5	15 19.1	55 49.6	1.38	56 6.4	1.41	22 39.1	2.24	26.9
7	15 23.7	15 28.4	56 23.5	1.42	56 40.6	1.42	23 33.0	2.24	27.9
8	15 33.0	15 37.5	56 57.5	1.39	57 14.0	1.35	6		28.9
9	15 41.8	15 45.9	57 29.8	1.29	57 44.9	1.22	0 26.3	2.20	0.4
							1 18.2	2.13	1.4
10	15 49.7	15 53.3	57 59.0	1.14	58 12.2	1.05	2 8.4	2.06	2.4
11	15 56.6	15 59.6	58 24.3	0.96	58 35.2	0.87	2 57.2	2.02	3.4
12	16 2.3	16 4.7	58 45.1	0.77	58 53.8	0.68	3 45.4	2.01	4.4
13	16 6.8	16 8.5	59 1.4	0.58	59 7.8	0.49	4 34.0	2.05	5.4
14	16 9.9	16 11.1	59 13.1	0.39	59 17.3	0.29	5 24.1	2.14	6.4
15	16 11.9	16 12.3	59 20.2	+0.19	59 21.9	+0.08	6 16.7	2.26	7.4
16	16 12.4	16 12.1	59 22.2	-0.04	59 21.0	-0.17	7 12.4	2.39	8.4
17	16 11.3	16 10.1	59 18.2	0.30	59 18.8	0.44	8 11.2	2.49	9.4
18	16 8.4	16 6.2	59 7.7	0.59	58 59.7	0.73	9 11.7	2.53	10.4
19	16 3.6	16 0.5	58 50.0	0.88	58 38.5	1.03	10 12.1	2.48	11.4
20	15 56.9	15 52.8	58 25.3	1.17	58 10.4	1.30	11 10.3	2.35	12.4
21	15 48.4	15 43.6	57 54.1	1.41	57 36.7	1.50	12 4.8	2.19	13.4
22	15 38.6	15 33.4	57 18.3	1.56	56 59.2	1.60	12 55.3	2.02	14.4
23	15 28.2	15 22.9	56 39.8	1.61	56 20.4	1.60	13 42.1	1.89	15.4
24	15 17.7	15 12.7	56 1.4	1.56	55 43.1	1.49	14 26.1	1.79	16.4
25	15 8.0	15 3.7	55 25.8	1.30	55 9.8	1.26	15 8.3	1.74	17.4
26	14 59.8	14 56.4	54 55.4	1.12	54 42.9	0.95	15 49.8	1.73	18.4
27	14 53.5	14 51.3	54 32.5	0.77	54 24.4	0.58	16 31.5	1.76	19.4
28	14 49.7	14 48.8	54 18.6	-0.38	54 15.3	-0.17	17 14.4	1.82	20.4
29	14 48.7	14 49.2	54 14.6	+0.05	54 16.5	+0.27	17 59.2	1.91	21.4
30	14 50.4	14 52.3	54 21.0	0.48	54 28.1	0.69	18 46.4	2.02	22.4
31	14 54.9	14 58.1	54 37.6	0.89	54 49.4	1.07	19 36.2	2.13	23.4
32	15 1.9	15 6.3	55 3.4	+1.25	55 19.4	+1.41	20 28.3	2.21	24.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	1 23 52.98	1.9022	N.14° 24' 29.2	10.548	0	2 59 24.63	2.0897	N.21° 31' 36.0	4.983
1	1 25 47.20	1.9052	14 35 0.4	10.491	1	3 1 30.15	2.0942	21 38 30.3	4.886
2	1 27 41.60	1.9082	14 45 28.1	10.432	2	3 3 35.93	2.0988	21 45 18.9	4.783
3	1 29 36.19	1.9113	14 55 52.3	10.373	3	3 5 41.98	2.1080	21 52 1.8	4.687
4	1 31 30.96	1.9146	15 6 12.9	10.313	4	3 7 48.29	2.1075	21 58 38.9	4.570
5	1 33 25.93	1.9177	15 16 29.9	10.253	5	3 9 54.87	2.1119	22 5 10.2	4.472
6	1 35 21.09	1.9210	15 26 43.3	10.192	6	3 12 1.72	2.1163	22 11 35.6	4.373
7	1 37 16.45	1.9242	15 36 53.0	10.130	7	3 14 8.83	2.1207	22 17 55.0	4.274
8	1 39 12.01	1.9277	15 46 59.0	10.068	8	3 16 16.20	2.1251	22 24 8.5	4.174
9	1 41 7.78	1.9311	15 57 1.2	10.006	9	3 18 23.84	2.1295	22 30 16.0	4.074
10	1 43 3.75	1.9346	16 6 59.6	9.942	10	3 20 31.74	2.1339	22 36 17.4	3.973
11	1 44 59.93	1.9381	16 16 54.2	9.878	11	3 22 39.90	2.1382	22 42 12.6	3.869
12	1 46 56.32	1.9417	16 26 44.9	9.813	12	3 24 48.33	2.1426	22 48 1.7	3.766
13	1 48 52.93	1.9453	16 36 31.7	9.747	13	3 26 57.02	2.1469	22 53 44.5	3.662
14	1 50 49.75	1.9489	16 46 14.5	9.680	14	3 29 5.97	2.1513	22 59 21.1	3.557
15	1 52 46.79	1.9526	16 55 53.3	9.613	15	3 31 15.17	2.1556	23 4 51.3	3.451
16	1 54 44.06	1.9563	17 5 28.0	9.545	16	3 33 24.63	2.1599	23 10 15.2	3.344
17	1 56 41.55	1.9600	17 14 58.6	9.476	17	3 35 34.35	2.1642	23 15 32.6	3.237
18	1 58 39.26	1.9638	17 24 25.1	9.406	18	3 37 44.33	2.1684	23 20 43.6	3.130
19	2 0 37.20	1.9676	17 33 47.4	9.336	19	3 39 54.56	2.1728	23 25 48.1	3.020
20	2 2 35.38	1.9714	17 43 5.4	9.266	20	3 42 5.04	2.1769	23 30 46.0	2.910
21	2 4 33.78	1.9752	17 52 19.1	9.193	21	3 44 15.77	2.1810	23 35 37.3	2.800
22	2 6 32.42	1.9792	18 1 28.5	9.120	22	3 46 26.76	2.1852	23 40 22.0	2.689
23	2 8 31.30	1.9832	N.18 10 33.5	9.046	23	3 48 38.00	2.1893	N.23 44 59.9	2.576
TUESDAY 2.					THURSDAY 4.				
0	2 10 30.41	1.9872	N.18 19 34.1	8.973	0	3 50 49.48	2.1934	N.23 49 31.1	2.463
1	2 12 29.76	1.9912	18 28 30.2	8.907	1	3 53 1.20	2.1974	23 53 55.5	2.350
2	2 14 29.36	1.9953	18 37 21.8	8.821	2	3 55 13.17	2.2014	23 58 13.1	2.238
3	2 16 29.20	1.9994	18 46 8.8	8.745	3	3 57 25.37	2.2054	24 2 23.8	2.126
4	2 18 29.28	2.0035	18 54 51.2	8.669	4	3 59 37.81	2.2093	24 6 27.5	2.004
5	2 20 29.61	2.0077	19 3 29.0	8.590	5	4 1 50.48	2.2132	24 10 24.3	1.886
6	2 22 30.20	2.0118	19 12 2.0	8.511	6	4 4 3.39	2.2170	24 14 14.1	1.771
7	2 24 31.04	2.0160	19 20 30.3	8.431	7	4 6 16.52	2.2208	24 17 56.8	1.653
8	2 26 32.12	2.0202	19 28 53.7	8.350	8	4 8 29.88	2.2246	24 21 32.4	1.538
9	2 28 33.46	2.0244	19 37 12.3	8.269	9	4 10 43.46	2.2283	24 25 0.8	1.414
10	2 30 35.05	2.0287	19 45 26.0	8.187	10	4 12 57.27	2.2319	24 28 22.1	1.294
11	2 32 36.90	2.0330	19 53 34.8	8.106	11	4 15 11.29	2.2356	24 31 36.2	1.174
12	2 34 39.01	2.0373	20 1 38.6	8.022	12	4 17 25.53	2.2391	24 34 43.0	1.053
13	2 36 41.38	2.0416	20 9 37.4	7.937	13	4 19 39.98	2.2426	24 37 42.5	0.930
14	2 38 44.00	2.0459	20 17 31.0	7.852	14	4 21 54.64	2.2461	24 40 34.6	0.807
15	2 40 46.88	2.0502	20 25 19.5	7.766	15	4 24 9.51	2.2495	24 43 19.4	0.684
16	2 42 50.02	2.0545	20 33 2.7	7.679	16	4 26 24.58	2.2529	24 45 56.7	0.560
17	2 44 53.42	2.0589	20 40 40.7	7.590	17	4 28 39.85	2.2562	24 48 26.6	0.436
18	2 46 57.09	2.0633	20 48 13.5	7.501	18	4 30 55.32	2.2594	24 50 49.0	0.310
19	2 49 1.02	2.0677	20 55 40.9	7.412	19	4 33 10.98	2.2626	24 53 3.8	0.184
20	2 51 5.21	2.0721	21 3 2.9	7.323	20	4 35 26.83	2.2657	24 55 11.1	0.056
21	2 53 9.67	2.0765	21 10 19.4	7.230	21	4 37 42.87	2.2688	24 57 10.8	1.981
22	2 55 14.39	2.0809	21 17 30.5	7.138	22	4 39 59.09	2.2718	24 59 2.8	1.803
23	2 57 19.38	2.0853	21 24 36.1	7.046	23	4 42 15.49	2.2747	25 0 47.2	1.675
24	2 59 24.63	2.0897	N.21 31 36.0	6.953	24	4 44 32.06	2.2776	N.25 2 23.9	1.546

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	D.M. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	D.M. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	4 44 32.06	2.3776	N.25° 2' 23.9	1.446	0	6 35 43.19	2.3244	N.23° 42' 1.7	4.942
1	4 46 48.80	2.3804	25 3 52.8	1.417	1	6 38 2.63	2.3226	23 37 1.2	5.076
2	4 49 5.71	2.3831	25 5 14.0	1.388	2	6 40 22.01	2.3226	23 31 52.6	5.210
3	4 51 22.78	2.3866	25 6 27.4	1.360	3	6 42 41.32	2.3213	23 26 36.0	5.343
4	4 53 40.01	2.3884	25 7 33.0	1.028	4	6 45 0.57	2.3201	23 21 11.4	5.476
5	4 55 57.39	2.3900	25 8 30.7	0.987	5	6 47 19.74	2.3188	23 15 38.9	5.609
6	4 58 14.92	2.3923	25 9 20.6	0.765	6	6 49 38.84	2.3176	23 9 58.4	5.741
7	5 0 32.59	2.3907	25 10 2.5	0.683	7	6 51 57.85	2.3162	23 4 10.0	5.873
8	5 2 50.40	2.3900	25 10 36.5	0.601	8	6 54 16.78	2.3146	22 58 13.7	6.004
9	5 5 8.35	2.3902	25 11 2.5	0.568	9	6 56 35.62	2.3138	22 52 9.5	6.136
10	5 7 26.43	2.3923	25 11 20.6	0.585	10	6 58 54.37	2.3117	22 45 57.5	6.268
11	5 9 44.63	2.3944	25 11 30.7	0.101	11	7 1 13.02	2.3101	22 39 37.7	6.396
12	5 12 2.96	2.3904	25 11 32.7	0.083	12	7 3 31.58	2.3084	22 33 10.1	6.524
13	5 14 21.40	2.3923	25 11 26.7	0.167	13	7 5 50.03	2.3067	22 26 34.7	6.653
14	5 16 39.96	2.3102	25 11 12.6	0.302	14	7 8 8.38	2.3049	22 19 51.7	6.781
15	5 18 58.63	2.3120	25 10 50.4	0.487	15	7 10 26.62	2.3031	22 13 1.0	6.908
16	5 21 17.40	2.3137	25 10 20.1	0.572	16	7 12 44.75	2.3012	22 6 2.7	7.035
17	5 23 36.27	2.3153	25 9 41.7	0.708	17	7 15 2.76	2.2993	21 58 56.8	7.161
18	5 25 55.23	2.3168	25 8 55.1	0.844	18	7 17 20.66	2.2973	21 51 43.3	7.287
19	5 28 14.28	2.3182	25 8 0.4	0.980	19	7 19 38.44	2.2953	21 44 22.3	7.412
20	5 30 33.41	2.3196	25 6 57.5	1.116	20	7 21 56.09	2.2932	21 36 53.8	7.538
21	5 32 52.62	2.3200	25 5 46.4	1.263	21	7 24 13.61	2.2911	21 29 17.9	7.660
22	5 35 11.91	2.3221	25 4 27.1	1.390	22	7 26 31.01	2.2889	21 21 34.6	7.783
23	5 37 31.27	2.3233	N.25 2 59.6	1.527	23	7 28 48.28	2.2867	N.21 13 43.9	7.906
SATURDAY 6.					MONDAY 8.				
0	5 39 50.69	2.3246	N.25 1 23.9	1.664	0	7 31 5.41	2.2844	N.21 5 45.9	8.028
1	5 42 10.17	2.3261	24 59 40.0	1.801	1	7 33 22.40	2.2821	20 57 40.6	8.148
2	5 44 29.70	2.3280	24 57 47.9	1.988	2	7 35 39.26	2.2798	20 49 28.1	8.268
3	5 46 49.28	2.3298	24 55 47.5	2.074	3	7 37 55.97	2.2774	20 41 8.5	8.387
4	5 49 8.91	2.3276	24 53 38.9	2.311	4	7 40 12.54	2.2750	20 32 41.7	8.506
5	5 51 28.58	2.3261	24 51 22.1	2.348	5	7 42 28.96	2.2725	20 24 7.8	8.628
6	5 53 48.28	2.3286	24 48 57.1	2.485	6	7 44 45.24	2.2700	20 15 26.9	8.740
7	5 56 8.01	2.3290	24 46 23.8	2.623	7	7 47 1.37	2.2675	20 6 39.0	8.856
8	5 58 27.76	2.3294	24 43 42.3	2.760	8	7 49 17.34	2.2650	19 57 44.2	8.971
9	6 0 47.53	2.3297	24 40 52.6	2.898	9	7 51 33.16	2.2624	19 48 42.5	9.085
10	6 3 7.32	2.3299	24 37 54.6	3.035	10	7 53 48.83	2.2598	19 39 34.0	9.199
11	6 5 27.12	2.3300	24 34 48.4	3.173	11	7 56 4.34	2.2573	19 30 18.7	9.310
12	6 7 46.92	2.3300	24 31 34.0	3.309	12	7 58 19.69	2.2548	19 20 56.7	9.423
13	6 10 6.72	2.3300	24 28 11.4	3.446	13	8 0 34.88	2.2519	19 11 28.1	9.533
14	6 12 26.52	2.3299	24 24 40.5	3.583	14	8 2 49.92	2.2493	19 1 52.8	9.643
15	6 14 46.31	2.3297	24 21 1.4	3.720	15	8 5 4.80	2.2466	18 52 10.9	9.752
16	6 17 6.08	2.3294	24 17 14.1	3.857	16	8 7 19.51	2.2439	18 42 22.6	9.860
17	6 19 25.83	2.3290	24 13 18.6	3.993	17	8 9 34.06	2.2412	18 32 27.8	9.966
18	6 21 45.56	2.3286	24 9 14.9	4.130	18	8 11 48.45	2.2385	18 22 26.7	10.072
19	6 24 5.26	2.3280	24 5 3.0	4.266	19	8 14 2.68	2.2358	18 12 19.2	10.177
20	6 26 24.93	2.3274	24 0 43.0	4.402	20	8 16 16.75	2.2331	18 2 5.4	10.281
21	6 28 44.56	2.3268	23 56 14.8	4.538	21	8 18 30.65	2.2303	17 51 45.4	10.384
22	6 31 4.15	2.3261	23 51 38.5	4.673	22	8 20 44.39	2.2276	17 41 19.3	10.486
23	6 33 23.70	2.3253	23 46 54.1	4.807	23	8 22 57.96	2.2248	17 30 47.1	10.587
24	6 35 43.19	2.3244	N.23 42 1.7	4.942	24	8 25 11.37	2.2221	N.17 20 8.8	10.687

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	8 25 11.37	2.3221	N.17° 20' 8.8"	10.687	0	10 9 0.49	2.1164	N. 7° 13' 9.2"	14.188
1	8 27 24.61	2.3198	17 9 24.6	10.786	1	10 11 7.43	2.1129	6 58 58.8	14.196
2	8 29 37.69	2.3166	16 58 34.5	10.884	2	10 13 14.31	2.1141	6 44 45.8	14.287
3	8 31 50.60	2.3188	16 47 38.5	10.981	3	10 15 21.12	2.1120	6 30 30.4	14.277
4	8 34 3.35	2.3110	16 36 36.8	11.077	4	10 17 27.87	2.1120	6 16 12.6	14.316
5	8 36 15.93	2.2088	16 25 29.4	11.171	5	10 19 34.56	2.1111	6 1 52.5	14.333
6	8 38 28.35	2.2066	16 14 16.3	11.264	6	10 21 41.20	2.1103	5 47 30.2	14.380
7	8 40 40.61	2.2080	16 2 57.6	11.367	7	10 23 47.78	2.1094	5 33 5.8	14.424
8	8 42 52.71	2.2008	15 51 33.4	11.449	8	10 25 54.32	2.1086	5 18 39.3	14.468
9	8 45 4.65	2.1976	15 40 3.7	11.589	9	10 28 0.81	2.1079	5 4 10.8	14.491
10	8 47 16.42	2.1949	15 28 28.7	11.628	10	10 30 7.27	2.1073	4 49 40.4	14.522
11	8 49 28.03	2.1928	15 16 48.4	11.716	11	10 32 13.69	2.1067	4 35 8.2	14.562
12	8 51 39.49	2.1896	15 5 2.8	11.803	12	10 34 20.08	2.1062	4 20 34.2	14.581
13	8 53 50.79	2.1870	14 53 12.0	11.889	13	10 36 26.44	2.1066	4 5 58.6	14.606
14	8 56 1.93	2.1844	14 41 16.1	11.974	14	10 38 32.78	2.1064	3 51 21.3	14.634
15	8 58 12.91	2.1818	14 29 15.1	12.068	15	10 40 39.09	2.1061	3 36 42.5	14.660
16	9 0 23.74	2.1792	14 17 9.2	12.141	16	10 42 45.39	2.1048	3 22 2.2	14.683
17	9 2 34.42	2.1767	14 4 58.3	12.222	17	10 44 51.67	2.1047	3 7 20.5	14.706
18	9 4 44.94	2.1743	13 52 42.6	12.302	18	10 46 57.95	2.1046	2 52 37.6	14.726
19	9 6 55.31	2.1717	13 40 22.1	12.381	19	10 49 4.23	2.1046	2 37 53.4	14.746
20	9 9 5.54	2.1692	13 27 56.9	12.449	20	10 51 10.50	2.1046	2 23 8.1	14.764
21	9 11 15.62	2.1668	13 15 27.0	12.536	21	10 53 16.78	2.1047	2 8 21.7	14.781
22	9 13 25.56	2.1644	13 2 52.6	12.612	22	10 55 23.06	2.1048	1 53 34.4	14.797
23	9 15 35.35	2.1620	N.12° 50' 13.6"	12.687	23	10 57 29.36	2.1051	N. 1° 38' 46.1"	14.813
WEDNESDAY 10.					FRIDAY 12.				
0	9 17 45.00	2.1596	N.12° 37' 30.2"	12.760	0	10 59 35.67	2.1064	N. 1° 23' 57.0"	14.826
1	9 19 54.51	2.1573	12 24 42.5	12.831	1	11 1 42.00	2.1067	1 9 7.1	14.837
2	9 22 3.88	2.1551	12 11 50.5	12.902	2	11 3 48.36	2.1063	0 54 16.6	14.847
3	9 24 13.12	2.1529	11 58 54.3	12.972	3	11 5 54.75	2.1067	0 39 25.5	14.866
4	9 26 22.23	2.1507	11 45 53.9	13.040	4	11 8 1.17	2.1073	0 24 33.9	14.884
5	9 28 31.20	2.1486	11 32 49.4	13.107	5	11 10 7.62	2.1079	N. 0° 9' 41.8"	14.871
6	9 30 40.05	2.1464	11 19 41.0	13.173	6	11 12 14.12	2.1067	S. 0° 5' 10.6"	14.876
7	9 32 48.77	2.1443	11 6 28.7	13.237	7	11 14 20.67	2.1066	0 20 3.3	14.886
8	9 34 57.37	2.1422	10 53 12.5	13.300	8	11 16 27.26	2.1108	0 34 56.2	14.893
9	9 37 5.85	2.1403	10 39 52.6	13.363	9	11 18 33.91	2.1113	0 49 49.3	14.896
10	9 39 14.21	2.1384	10 26 28.9	13.426	10	11 20 40.61	2.1122	1 4 42.4	14.898
11	9 41 22.46	2.1365	10 13 1.6	13.486	11	11 22 47.38	2.1124	1 19 35.5	14.894
12	9 43 30.59	2.1346	9 59 30.7	13.544	12	11 24 54.22	2.1146	1 34 28.4	14.891
13	9 45 38.61	2.1328	9 45 56.4	13.601	13	11 27 1.13	2.1168	1 49 21.1	14.877
14	9 47 46.53	2.1311	9 32 18.6	13.657	14	11 29 8.11	2.1171	2 4 13.6	14.872
15	9 49 54.35	2.1294	9 18 37.5	13.713	15	11 31 15.18	2.1166	2 19 5.7	14.866
16	9 52 2.06	2.1277	9 4 53.1	13.768	16	11 33 22.33	2.1200	2 33 57.4	14.867
17	9 54 9.67	2.1261	8 51 5.5	13.819	17	11 35 29.57	2.1216	2 48 48.5	14.848
18	9 56 17.19	2.1246	8 37 14.8	13.871	18	11 37 36.90	2.1221	3 3 39.1	14.838
19	9 58 24.62	2.1231	8 23 21.0	13.921	19	11 39 44.33	2.1247	3 18 29.0	14.836
20	10 0 31.96	2.1216	8 9 24.3	13.970	20	11 41 51.86	2.1264	3 33 18.2	14.813
21	10 2 39.21	2.1202	7 55 24.7	14.017	21	11 43 59.49	2.1282	3 48 6.5	14.796
22	10 4 46.38	2.1189	7 41 22.2	14.063	22	11 46 7.24	2.1301	4 2 53.9	14.782
23	10 6 53.47	2.1176	7 27 17.0	14.108	23	11 48 15.10	2.1320	4 17 40.3	14.766
24	10 9 0.49	2.1164	N. 7° 13' 9.2"	14.182	24	11 50 23.08	2.1341	S. 4° 32' 25.7"	14.746

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	11 50 23.08	2.1341	S. 4 32' 25.7"	14.746	0	13 36 25.32	2.3067	S. 15 32' 2.1"	12.184
1	11 52 31.19	2.1363	4 47 9.9	14.736	1	13 38 43.87	2.3116	15 44 10.5	12.096
2	11 54 39.42	2.1383	5 1 52.8	14.705	2	13 41 2.71	2.3164	15 56 13.5	12.004
3	11 56 47.78	2.1405	5 16 34.4	14.682	3	13 43 21.84	2.3213	16 8 11.0	11.912
4	11 58 56.28	2.1428	5 31 14.6	14.646	4	13 45 41.27	2.3262	16 20 3.0	11.818
5	12 1 4.92	2.1452	5 45 53.3	14.682	5	13 48 1.00	2.3312	16 31 49.3	11.723
6	12 3 13.71	2.1477	6 0 30.4	14.606	6	13 50 21.02	2.3362	16 43 29.8	11.627
7	12 5 22.64	2.1503	6 15 5.9	14.577	7	13 52 41.34	2.3413	16 55 4.5	11.529
8	12 7 31.73	2.1528	6 29 39.6	14.547	8	13 55 1.96	2.3463	17 6 33.3	11.429
9	12 9 40.97	2.1554	6 44 11.5	14.516	9	13 57 22.88	2.3513	17 17 56.1	11.328
10	12 11 50.38	2.1581	6 58 41.4	14.482	10	13 59 44.11	2.3563	17 29 12.7	11.226
11	12 13 59.95	2.1609	7 13 9.4	14.449	11	14 2 5.64	2.3613	17 40 23.2	11.122
12	12 16 9.69	2.1638	7 27 35.3	14.414	12	14 4 27.47	2.3664	17 51 27.4	11.017
13	12 18 19.61	2.1667	7 41 59.1	14.377	13	14 6 49.61	2.3715	18 2 25.2	10.910
14	12 20 29.70	2.1697	7 56 20.6	14.339	14	14 9 12.05	2.3766	18 13 16.6	10.802
15	12 22 39.98	2.1728	8 10 39.7	14.299	15	14 11 34.79	2.3816	18 24 1.4	10.692
16	12 24 50.44	2.1759	8 24 56.5	14.258	16	14 13 57.84	2.3867	18 34 39.6	10.581
17	12 27 1.09	2.1792	8 39 10.8	14.217	17	14 16 21.19	2.3918	18 45 11.1	10.468
18	12 29 11.94	2.1825	8 53 22.5	14.174	18	14 18 44.85	2.3968	18 55 35.7	10.354
19	12 31 22.99	2.1858	9 7 31.5	14.128	19	14 21 8.81	2.4018	19 5 53.4	10.238
20	12 33 34.24	2.1892	9 21 37.8	14.081	20	14 23 33.06	2.4068	19 16 4.2	10.121
21	12 35 45.70	2.1927	9 35 41.2	14.033	21	14 25 57.62	2.4118	19 26 7.9	10.003
22	12 37 57.36	2.1962	9 49 41.7	13.984	22	14 28 22.48	2.4169	19 36 4.5	9.883
23	12 40 9.24	2.1998	S. 10 3 39.2	13.933	23	14 30 47.64	2.4219	S. 19 45 53.8	9.761
SUNDAY 14.					TUESDAY 16.				
0	12 42 21.33	2.2035	S. 10 17 33.6	13.881	0	14 33 13.11	2.4269	S. 19 55 35.8	9.638
1	12 44 33.65	2.2072	10 31 24.8	13.827	1	14 35 38.87	2.4318	20 5 10.4	9.516
2	12 46 46.19	2.2109	10 45 12.8	13.772	2	14 38 4.93	2.4368	20 14 37.6	9.390
3	12 48 58.95	2.2147	10 58 57.4	13.715	3	14 40 31.29	2.4417	20 23 57.2	9.263
4	12 51 11.95	2.2186	11 12 38.5	13.657	4	14 42 57.94	2.4466	20 33 9.1	9.138
5	12 53 25.18	2.2225	11 26 16.1	13.597	5	14 45 24.88	2.4515	20 42 13.3	9.006
6	12 55 38.65	2.2265	11 39 50.1	13.536	6	14 47 52.12	2.4564	20 51 9.7	8.874
7	12 57 52.36	2.2306	11 53 20.3	13.473	7	14 50 19.65	2.4613	20 59 58.2	8.743
8	13 0 6.32	2.2347	12 6 46.8	13.409	8	14 52 47.46	2.4660	21 8 38.8	8.608
9	13 2 20.53	2.2388	12 20 9.4	13.343	9	14 55 15.56	2.4707	21 17 11.3	8.474
10	13 4 34.98	2.2430	12 33 26.0	13.276	10	14 57 43.94	2.4754	21 25 35.7	8.338
11	13 6 49.09	2.2473	12 46 42.6	13.208	11	15 0 12.60	2.4800	21 33 51.9	8.201
12	13 9 4.65	2.2516	12 59 53.0	13.138	12	15 2 41.54	2.4846	21 41 59.9	8.063
13	13 11 19.88	2.2560	13 12 59.2	13.067	13	15 5 10.75	2.4891	21 49 59.5	7.923
14	13 13 35.37	2.2604	13 26 1.0	12.994	14	15 7 40.23	2.4936	21 57 50.7	7.782
15	13 15 51.13	2.2648	13 38 58.4	12.920	15	15 10 9.97	2.4978	22 5 33.4	7.640
16	13 18 7.15	2.2693	13 51 51.3	12.844	16	15 12 39.97	2.5022	22 13 7.5	7.497
17	13 20 23.45	2.2739	14 4 39.7	12.767	17	15 15 10.23	2.5066	22 20 33.0	7.353
18	13 22 40.02	2.2785	14 17 23.4	12.688	18	15 17 40.75	2.5107	22 27 49.8	7.208
19	13 24 56.87	2.2831	14 30 2.3	12.608	19	15 20 11.52	2.5148	22 34 57.8	7.060
20	13 27 13.99	2.2878	14 42 36.3	12.526	20	15 22 42.53	2.5189	22 41 57.0	6.912
21	13 29 31.40	2.2925	14 55 5.4	12.443	21	15 25 13.79	2.5229	22 48 47.3	6.763
22	13 31 49.09	2.2972	15 7 29.5	12.358	22	15 27 45.28	2.5268	22 55 28.6	6.613
23	13 34 7.06	2.3019	15 19 48.4	12.273	23	15 30 17.01	2.5307	23 2 0.9	6.462
24	13 36 25.32	2.3067	S. 15 32 2.1	12.184	24	15 32 48.96	2.5344	S. 23 8 24.2	6.310

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.	Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	15 32 48.96	2.5344	S. 23° 8' 24.2"	6.310	0	17 36 42.56	2.5787	S. 25° 3' 19.6"	1.634
1	15 35 21.14	2.5381	23 14 38.3	6.187	1	17 39 17.21	2.5763	25 1 36.6	1.590
2	15 37 53.53	2.5417	23 20 43.1	6.063	2	17 41 51.72	2.5738	24 59 43.6	1.545
3	15 40 26.14	2.5452	23 26 38.7	5.940	3	17 44 26.08	2.5713	24 57 40.7	1.500
4	15 42 58.95	2.5488	23 32 25.0	5.813	4	17 47 0.27	2.5688	24 55 28.0	1.455
5	15 45 31.96	2.5519	23 38 1.9	5.686	5	17 49 34.29	2.5667	24 53 5.4	1.408
6	15 48 5.17	2.5551	23 43 29.4	5.578	6	17 52 8.15	2.5627	24 50 33.0	1.361
7	15 50 38.57	2.5583	23 48 47.3	5.450	7	17 54 41.82	2.5606	24 47 50.9	1.313
8	15 53 12.15	2.5613	23 53 55.7	5.361	8	17 57 15.30	2.5584	24 44 59.0	1.264
9	15 55 45.91	2.5641	23 58 54.5	5.260	9	17 59 48.58	2.5559	24 41 57.5	1.215
10	15 58 19.84	2.5669	24 3 43.7	5.180	10	18 2 21.66	2.5535	24 38 46.3	1.165
11	16 0 53.94	2.5696	24 8 23.2	5.077	11	18 4 54.53	2.5499	24 35 25.6	1.114
12	16 3 28.19	2.5722	24 12 53.0	4.915	12	18 7 27.17	2.5423	24 31 55.4	1.062
13	16 6 2.59	2.5746	24 17 13.0	4.782	13	18 9 59.59	2.5383	24 28 15.7	1.010
14	16 8 37.14	2.5769	24 21 23.3	4.686	14	18 12 31.77	2.5344	24 24 26.6	0.957
15	16 11 11.83	2.5792	24 25 23.7	4.594	15	18 15 3.72	2.5304	24 20 28.1	0.903
16	16 13 46.64	2.5813	24 29 14.2	4.500	16	18 17 35.42	2.5262	24 16 20.4	0.848
17	16 16 21.58	2.5833	24 32 54.8	4.384	17	18 20 6.86	2.5219	24 12 3.4	0.793
18	16 18 56.63	2.5851	24 36 25.5	4.296	18	18 22 38.05	2.5175	24 7 37.2	0.737
19	16 21 31.78	2.5868	24 39 46.2	4.202	19	18 25 8.98	2.5131	24 3 1.9	0.681
20	16 24 7.04	2.5884	24 42 56.9	4.095	20	18 27 39.63	2.5085	23 58 17.6	0.624
21	16 26 42.39	2.5899	24 45 57.6	3.998	21	18 30 10.00	2.5038	23 53 24.3	0.567
22	16 29 17.83	2.5913	24 48 48.2	3.700	22	18 32 40.09	2.4991	23 48 22.0	0.510
23	16 31 53.35	2.5926	S. 24° 51' 28.8"	2.592	23	18 35 9.90	2.4943	S. 23° 43' 10.8"	0.453
THURSDAY 18.					SATURDAY 20.				
0	16 34 28.93	2.5936	S. 24° 53' 59.3"	2.484	0	18 37 39.41	2.4894	S. 23° 37' 50.9"	0.405
1	16 37 4.57	2.5945	24 56 19.7	2.385	1	18 40 8.63	2.4844	23 32 22.2	0.350
2	16 39 40.27	2.5954	24 58 29.9	2.286	2	18 42 37.54	2.4793	23 26 44.9	0.294
3	16 42 16.02	2.5961	25 0 29.9	1.988	3	18 45 6.14	2.4741	23 20 59.0	0.238
4	16 44 51.80	2.5966	25 2 19.8	1.747	4	18 47 34.43	2.4688	23 15 4.6	0.177
5	16 47 27.61	2.5970	25 3 59.5	1.577	5	18 50 2.40	2.4635	23 9 1.7	0.117
6	16 50 3.44	2.5973	25 5 29.0	1.407	6	18 52 30.05	2.4581	23 2 50.5	0.056
7	16 52 39.29	2.5976	25 6 48.3	1.287	7	18 54 57.37	2.4537	22 56 31.0	0.003
8	16 55 15.14	2.5978	25 7 57.4	1.087	8	18 57 24.37	2.4471	22 50 3.3	0.029
9	16 57 50.99	2.5974	25 8 56.3	0.886	9	18 59 51.03	2.4415	22 43 27.4	0.005
10	17 0 26.83	2.5971	25 9 44.9	0.736	10	19 2 17.35	2.4358	22 36 43.5	0.789
11	17 3 2.64	2.5967	25 10 23.3	0.566	11	19 4 43.33	2.4301	22 29 51.6	0.632
12	17 5 38.43	2.5961	25 10 51.5	0.386	12	19 7 8.97	2.4243	22 22 51.7	0.003
13	17 8 14.18	2.5954	25 11 9.6	0.216	13	19 9 34.25	2.4184	22 15 44.0	0.198
14	17 10 49.88	2.5946	25 11 17.5	0.046	14	19 11 59.18	2.4125	22 8 28.6	0.231
15	17 13 25.53	2.5937	25 11 15.2	0.128	15	19 14 23.75	2.4066	22 1 5.6	0.447
16	17 16 1.12	2.5926	25 11 2.8	0.292	16	19 16 47.97	2.4006	21 53 35.0	0.573
17	17 18 36.63	2.5913	25 10 40.2	0.461	17	19 19 11.82	2.3945	21 45 56.9	0.697
18	17 21 12.07	2.5899	25 10 7.5	0.680	18	19 21 35.31	2.3884	21 38 11.4	0.819
19	17 23 47.42	2.5883	25 9 24.6	0.798	19	19 23 58.43	2.3823	21 30 18.6	0.940
20	17 26 22.67	2.5866	25 8 31.7	0.966	20	19 26 21.18	2.3760	21 22 18.6	0.000
21	17 28 57.82	2.5848	25 7 28.7	1.134	21	19 28 43.56	2.3696	21 14 11.4	0.176
22	17 31 32.85	2.5829	25 6 15.7	1.301	22	19 31 5.56	2.3633	21 5 57.2	0.358
23	17 34 7.77	2.5808	25 4 52.7	1.468	23	19 33 27.19	2.3574	20 57 36.0	0.410
24	17 36 42.56	2.5787	S. 25° 3' 19.6"	1.634	24	19 35 48.45	2.3511	S. 20° 49' 8.0"	0.534

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	19 35 48.45	2.3611	S. 20° 49' 8.0	8.824	0	21 21 25.76	2.0687	S. 12° 16' 28.7	12.287
1	19 38 9.33	2.3448	20 40 33.1	8.637	1	21 23 29.13	2.0685	12 4 10.1	12.329
2	19 40 29.83	2.3385	20 31 51.5	8.748	2	21 25 32.18	2.0484	11 51 48.9	12.376
3	19 42 49.95	2.3321	20 23 3.3	8.868	3	21 27 34.93	2.0483	11 39 25.1	12.417
4	19 45 9.68	2.3268	20 14 8.6	8.966	4	21 29 37.37	2.0382	11 26 58.9	12.466
5	19 47 29.03	2.3194	20 5 7.4	9.073	5	21 31 39.51	2.0382	11 14 30.2	12.497
6	19 49 48.00	2.3180	19 55 59.9	9.178	6	21 33 41.35	2.0282	11 1 59.2	12.535
7	19 52 6.59	2.3066	19 46 46.1	9.283	7	21 35 42.89	2.0282	10 49 25.9	12.573
8	19 54 24.79	2.3002	19 37 26.1	9.384	8	21 37 44.14	2.0185	10 36 50.4	12.609
9	19 56 42.60	2.2937	19 28 0.0	9.485	9	21 39 45.10	2.0187	10 24 12.8	12.644
10	19 59 0.03	2.2873	19 18 27.9	9.584	10	21 41 45.78	2.0090	10 11 33.1	12.678
11	20 1 17.07	2.2808	19 8 49.9	9.683	11	21 43 46.17	2.0043	9 58 51.5	12.710
12	20 3 33.73	2.2744	18 59 6.1	9.778	12	21 45 46.29	1.9997	9 46 7.9	12.741
13	20 5 50.00	2.2680	18 49 16.6	9.873	13	21 47 46.14	1.9952	9 33 22.5	12.773
14	20 8 5.89	2.2616	18 39 21.4	9.968	14	21 49 45.71	1.9907	9 20 35.3	12.801
15	20 10 21.39	2.2552	18 29 20.6	10.063	15	21 51 45.02	1.9863	9 7 46.4	12.829
16	20 12 36.51	2.2488	18 19 14.4	10.158	16	21 53 44.06	1.9820	8 54 55.8	12.856
17	20 14 51.25	2.2424	18 9 2.8	10.257	17	21 55 42.85	1.9777	8 42 3.7	12.882
18	20 17 5.60	2.2360	17 58 45.9	10.354	18	21 57 41.38	1.9735	8 29 10.0	12.907
19	20 19 19.57	2.2297	17 48 23.8	10.450	19	21 59 39.66	1.9693	8 16 14.9	12.930
20	20 21 33.16	2.2233	17 37 56.7	10.544	20	22 1 37.69	1.9652	8 3 18.4	12.962
21	20 23 46.36	2.2170	17 27 24.5	10.637	21	22 3 35.48	1.9612	7 50 20.6	12.973
22	20 25 59.19	2.2107	17 16 47.4	10.699	22	22 5 33.03	1.9572	7 37 21.6	12.993
23	20 28 11.64	2.2044	S. 17 6 5.4	10.739	23	22 7 30.35	1.9533	S. 7 24 21.4	12.013
MONDAY 22.					WEDNESDAY 24.				
0	20 30 23.72	2.1981	S. 16 55 18.7	10.818	0	22 9 27.43	1.9495	S. 7 11 20.0	12.061
1	20 32 35.42	2.1919	16 44 27.3	10.896	1	22 11 24.28	1.9457	6 58 17.6	12.048
2	20 34 46.75	2.1857	16 33 31.3	10.971	2	22 13 20.91	1.9420	6 45 14.2	12.074
3	20 36 57.70	2.1795	16 22 30.8	11.046	3	22 15 17.32	1.9383	6 32 9.8	12.080
4	20 39 8.29	2.1734	16 11 25.8	11.119	4	22 17 13.51	1.9347	6 19 4.5	12.086
5	20 41 18.51	2.1673	16 0 16.5	11.190	5	22 19 9.49	1.9312	6 5 58.4	12.106
6	20 43 28.36	2.1612	15 49 3.0	11.260	6	22 21 5.26	1.9278	5 52 51.5	12.120
7	20 45 37.85	2.1551	15 37 45.3	11.328	7	22 23 0.83	1.9244	5 39 43.9	12.123
8	20 47 46.97	2.1491	15 26 23.6	11.395	8	22 24 56.19	1.9211	5 26 35.7	12.143
9	20 49 55.73	2.1431	15 14 57.9	11.461	9	22 26 51.36	1.9178	5 13 26.9	12.152
10	20 52 4.14	2.1372	15 3 28.3	11.526	10	22 28 46.33	1.9147	5 0 17.5	12.160
11	20 54 12.19	2.1313	14 51 54.8	11.589	11	22 30 41.12	1.9116	4 47 7.6	12.168
12	20 56 19.89	2.1254	14 40 17.6	11.651	12	22 32 35.72	1.9086	4 33 57.3	12.178
13	20 58 27.24	2.1196	14 28 36.7	11.711	13	22 34 30.14	1.9056	4 20 46.7	12.180
14	21 0 34.24	2.1138	14 16 52.3	11.770	14	22 36 24.39	1.9027	4 7 35.7	12.184
15	21 2 40.90	2.1081	14 5 4.4	11.827	15	22 38 18.46	1.8998	3 54 24.5	12.186
16	21 4 47.21	2.1024	13 53 13.0	11.883	16	22 40 12.37	1.8970	3 41 13.1	12.191
17	21 6 53.19	2.0968	13 41 18.3	11.938	17	22 42 6.11	1.8943	3 28 1.5	12.193
18	21 8 58.83	2.0912	13 29 20.4	11.992	18	22 43 59.69	1.8917	3 14 49.9	12.194
19	21 11 4.14	2.0857	13 17 19.3	12.046	19	22 45 53.12	1.8891	3 1 38.2	12.194
20	21 13 9.11	2.0802	13 5 15.1	12.099	20	22 47 46.39	1.8866	2 48 26.6	12.198
21	21 15 13.76	2.0748	12 53 7.8	12.155	21	22 49 39.52	1.8842	2 35 15.0	12.193
22	21 17 18.08	2.0694	12 40 57.6	12.193	22	22 51 32.50	1.8818	2 22 3.5	12.190
23	21 19 22.08	2.0640	12 28 44.5	12.241	23	22 53 25.34	1.8795	2 8 52.2	12.187
24	21 21 25.76	2.0587	S. 12 16 28.7	12.287	24	22 55 18.04	1.8773	S. 1 55 41.1	12.183

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	22 55 18.04	1.8773	S. 1 55 41.1	13.183	0	0 24 6.14	1.8477	N. 8 18 1.2	12.116
1	22 57 10.61	1.8762	1 42 30.2	13.178	1	0 25 57.03	1.8486	8 30 7.0	12.077
2	22 59 3.06	1.8731	1 29 19.7	13.173	2	0 27 47.97	1.8496	8 42 10.5	12.038
3	23 0 55.38	1.8710	1 16 9.5	13.168	3	0 29 38.97	1.8506	8 54 11.6	11.998
4	23 2 47.58	1.8691	1 2 59.8	13.169	4	0 31 30.04	1.8517	9 6 10.2	11.957
5	23 4 39.67	1.8672	0 49 50.5	13.161	5	0 33 21.18	1.8529	9 18 6.4	11.916
6	23 6 31.64	1.8654	0 36 41.7	13.142	6	0 35 12.39	1.8541	9 30 0.1	11.874
7	23 8 23.51	1.8636	0 23 33.5	13.133	7	0 37 3.67	1.8554	9 41 51.3	11.831
8	23 10 15.27	1.8619	S. 0 10 25.8	13.123	8	0 38 55.04	1.8569	9 53 39.9	11.788
9	23 12 6.93	1.8603	N. 0 2 41.2	13.111	9	0 40 46.49	1.8582	10 5 25.9	11.744
10	23 13 58.50	1.8587	0 15 47.5	13.099	10	0 42 38.03	1.8597	10 17 9.2	11.699
11	23 15 49.97	1.8572	0 28 53.0	13.086	11	0 44 29.65	1.8612	10 28 49.8	11.654
12	23 17 41.36	1.8558	0 41 57.8	13.073	12	0 46 21.37	1.8628	10 40 27.7	11.608
13	23 19 32.67	1.8544	0 55 1.7	13.058	13	0 48 13.19	1.8644	10 52 2.8	11.562
14	23 21 23.89	1.8531	1 8 4.8	13.043	14	0 50 5.10	1.8661	11 3 35.1	11.515
15	23 23 15.04	1.8518	1 21 6.9	13.027	15	0 51 57.12	1.8678	11 15 4.6	11.467
16	23 25 6.11	1.8507	1 34 8.1	13.010	16	0 53 49.24	1.8696	11 26 31.2	11.419
17	23 26 57.12	1.8496	1 47 8.2	12.993	17	0 55 41.47	1.8715	11 37 54.9	11.370
18	23 28 48.06	1.8486	2 0 7.3	12.976	18	0 57 33.82	1.8734	11 49 15.6	11.320
19	23 30 38.95	1.8476	2 13 5.3	12.957	19	0 59 26.28	1.8753	12 0 33.3	11.269
20	23 32 29.78	1.8467	2 26 2.2	12.938	20	1 1 18.86	1.8774	12 11 47.9	11.218
21	23 34 20.56	1.8459	2 38 57.9	12.919	21	1 3 11.57	1.8795	12 22 59.5	11.167
22	23 36 11.29	1.8451	2 51 52.3	12.897	22	1 5 4.40	1.8816	12 34 7.9	11.115
23	23 38 1.98	1.8444	N. 3 4 45.5	12.875	23	1 6 57.36	1.8837	N.12 45 13.1	11.061
FRIDAY 26.					SUNDAY 28.				
0	23 39 52.63	1.8438	N. 3 17 37.4	12.853	0	1 8 50.45	1.8860	N.12 56 15.2	11.007
1	23 41 43.24	1.8423	3 30 27.9	12.830	1	1 10 43.68	1.8883	13 7 14.0	10.953
2	23 43 33.82	1.8407	3 43 17.0	12.807	2	1 12 37.05	1.8906	13 18 9.6	10.898
3	23 45 24.37	1.8393	3 56 4.7	12.783	3	1 14 30.56	1.8930	13 29 1.9	10.843
4	23 47 14.90	1.8419	4 8 50.9	12.758	4	1 16 24.21	1.8954	13 39 50.8	10.787
5	23 49 5.40	1.8416	4 21 35.6	12.732	5	1 18 18.01	1.8979	13 50 36.3	10.730
6	23 50 55.89	1.8414	4 34 18.7	12.706	6	1 20 11.96	1.9005	14 1 18.4	10.673
7	23 52 46.36	1.8412	4 47 0.2	12.678	7	1 22 6.07	1.9031	14 11 57.1	10.615
8	23 54 36.83	1.8411	4 59 40.0	12.650	8	1 24 0.33	1.9057	14 22 32.2	10.556
9	23 56 27.29	1.8410	5 12 18.2	12.622	9	1 25 54.75	1.9084	14 33 3.8	10.497
10	23 58 17.75	1.8410	5 24 54.6	12.593	10	1 27 49.34	1.9111	14 43 31.8	10.437
11	0 0 8.21	1.8411	5 37 29.3	12.563	11	1 29 44.09	1.9139	14 53 56.2	10.377
12	0 1 58.68	1.8412	5 50 2.1	12.532	12	1 31 39.00	1.9167	15 4 17.0	10.316
13	0 3 49.16	1.8414	6 2 33.1	12.501	13	1 33 34.09	1.9196	15 14 34.0	10.253
14	0 5 39.65	1.8417	6 15 2.2	12.469	14	1 35 29.35	1.9225	15 24 47.3	10.190
15	0 7 30.16	1.8420	6 27 29.4	12.437	15	1 37 24.79	1.9254	15 34 56.8	10.127
16	0 9 20.69	1.8424	6 39 54.7	12.404	16	1 39 20.40	1.9284	15 45 2.5	10.063
17	0 11 11.25	1.8428	6 52 17.9	12.370	17	1 41 16.20	1.9315	15 55 4.3	9.998
18	0 13 1.83	1.8433	7 4 39.1	12.336	18	1 43 12.18	1.9346	16 5 2.2	9.932
19	0 14 52.45	1.8439	7 16 58.2	12.301	19	1 45 8.35	1.9378	16 14 56.1	9.866
20	0 16 43.10	1.8445	7 29 15.2	12.265	20	1 47 4.71	1.9410	16 24 46.1	9.799
21	0 18 33.79	1.8452	7 41 30.1	12.229	21	1 49 1.26	1.9442	16 34 32.0	9.731
22	0 20 24.53	1.8460	7 53 42.7	12.192	22	1 50 58.01	1.9474	16 44 13.9	9.663
23	0 22 15.31	1.8468	8 5 53.1	12.154	23	1 52 54.95	1.9507	16 53 51.6	9.594
24	0 24 6.14	1.8477	N. 8 18 1.2	12.116	24	1 54 52.09	1.9540	N.17 3 25.2	9.525

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					WEDNESDAY 31.				
0	1 ^h 54 ^m 52.09	1.9840	N.17° 3' 25.2"	9.395	0	3 ^h 33 ^m 2.95	2.1430	N.23° 6' 45.7"	5.330
1	1 56 49.43	1.9874	17 12 54.6	9.455	1	3 35 11.66	2.1471	23 12 2.3	5.294
2	1 58 46.98	1.9908	17 22 19.8	9.364	2	3 37 20.61	2.1512	23 17 12.6	5.118
3	2 0 44.73	1.9843	17 31 40.7	9.312	3	3 39 29.80	2.1553	23 22 16.5	5.011
4	2 2 42.69	1.9877	17 40 57.2	9.280	4	3 41 39.24	2.1594	23 27 13.9	4.903
5	2 4 40.86	1.9713	17 50 9.3	9.106	5	3 43 48.92	2.1634	23 32 4.8	4.794
6	2 6 39.25	1.9749	17 59 17.0	9.092	6	3 45 58.85	2.1674	23 36 49.2	4.684
7	2 8 37.85	1.9785	18 8 20.4	9.018	7	3 48 9.02	2.1714	23 41 27.0	4.574
8	2 10 36.66	1.9821	18 17 19.3	8.943	8	3 50 19.42	2.1754	23 45 58.1	4.463
9	2 12 35.69	1.9856	18 26 13.6	8.867	9	3 52 30.06	2.1795	23 50 22.6	4.352
10	2 14 34.95	1.9886	18 35 3.3	8.790	10	3 54 40.94	2.1832	23 54 40.4	4.240
11	2 16 34.43	1.9883	18 43 48.4	8.713	11	3 56 52.05	2.1871	23 58 51.4	4.127
12	2 18 34.13	1.9860	18 52 28.9	8.635	12	3 59 3.40	2.1910	24 2 55.6	4.013
13	2 20 34.06	2.0007	19 1 4.6	8.556	13	4 1 14.98	2.1948	24 6 53.0	3.899
14	2 22 34.21	2.0045	19 9 35.6	8.477	14	4 3 26.78	2.1986	24 10 43.5	3.784
15	2 24 34.59	2.0083	19 18 1.8	8.397	15	4 5 38.81	2.2024	24 14 27.1	3.668
16	2 26 35.20	2.0121	19 26 23.2	8.316	16	4 7 51.07	2.2062	24 18 3.7	3.552
17	2 28 36.04	2.0160	19 34 39.7	8.234	17	4 10 3.55	2.2099	24 21 33.3	3.435
18	2 30 37.12	2.0199	19 42 51.2	8.151	18	4 12 16.26	2.2136	24 24 55.9	3.317
19	2 32 38.44	2.0238	19 50 57.8	8.068	19	4 14 29.18	2.2173	24 28 11.4	3.199
20	2 34 39.99	2.0278	19 58 59.4	7.984	20	4 16 42.32	2.2209	24 31 19.8	3.080
21	2 36 41.78	2.0318	20 6 55.9	7.899	21	4 18 55.68	2.2244	24 34 21.0	2.961
22	2 38 43.81	2.0357	20 14 47.3	7.813	22	4 21 9.25	2.2279	24 37 15.1	2.841
23	2 40 46.07	2.0397	N.20 23 33.5	7.727	23	4 23 23.03	2.2314	N.24 40 1.9	2.720
TUESDAY 30.					THURSDAY, AUGUST 1.				
0	2 42 48.58	2.0436	N.20 30 14.6	7.640	0	4 25 37.01	2.2348	N.24 42 41.5	2.598
1	2 44 51.33	2.0479	20 37 50.4	7.553	PHASES OF THE MOON.				
2	2 46 54.33	2.0520	20 45 20.9	7.464					
3	2 48 57.57	2.0560	20 52 46.1	7.375					
4	2 51 1.05	2.0601	21 0 6.0	7.286					
5	2 53 4.78	2.0643	21 7 20.4	7.195	● New Moon, . . . 7 14 12.5 ☾ First Quarter, . . . 14 14 47.8 ○ Full Moon, . . . 21 12 6.0 ☾ Last Quarter, . . . 29 7 51.6				
6	2 55 8.76	2.0683	21 14 29.4	7.104					
7	2 57 12.99	2.0725	21 21 32.9	7.012					
8	2 59 17.47	2.0766	21 28 30.8	6.919					
9	3 1 22.19	2.0808	21 35 23.1	6.825	☾ Apogee, 1 3.0 ☾ Perigee, 15 20.3 ☾ Apogee, 28 21.2				
10	3 3 27.16	2.0849	21 42 9.8	6.731					
11	3 5 32.38	2.0891	21 48 50.8	6.636					
12	3 7 37.85	2.0932	21 55 26.1	6.540					
13	3 9 43.57	2.0974	22 1 55.6	6.443					
14	3 11 49.54	2.1015	22 8 19.2	6.345					
15	3 13 55.76	2.1057	22 14 37.0	6.247					
16	3 16 2.23	2.1098	22 20 48.9	6.148					
17	3 18 8.95	2.1140	22 26 54.8	6.048					
18	3 20 15.92	2.1181	22 32 54.7	5.948					
19	3 22 23.14	2.1223	22 38 48.6	5.847					
20	3 24 30.61	2.1264	22 44 36.4	5.745					
21	3 26 38.32	2.1306	22 50 18.0	5.642					
22	3 28 46.28	2.1347	22 55 53.5	5.539					
23	3 30 54.49	2.1389	23 1 22.7	5.435					
24	3 33 2.95	2.1430	N.23 6 45.7	5.330					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	α Aquilæ W.	83° 2' 52"	3006	84° 21' 18"	3006	85° 39' 47"	3001	86° 58' 20"	3006
	Fomalhaut W.	58 5 1	3063	59 23 7	3063	60 39 34	3045	61 57 20	3027
	α Pegasi W.	35 18 27	3007	36 38 43	3478	37 59 32	3450	39 20 52	3435
	Aldebaran E.	44 20 5	3174	42 53 25	3180	41 26 52	3186	40 0 26	3182
	SUN E.	74 51 29	3435	73 29 52	3434	72 8 14	3433	70 46 35	3431
2	α Aquilæ W.	93 31 49	3567	94 50 36	3564	96 9 30	3563	97 28 23	3562
	Fomalhaut W.	68 30 35	3562	69 50 2	3568	71 9 44	3525	72 29 40	3512
	α Pegasi W.	46 13 52	3326	47 37 33	3309	49 1 34	3293	50 25 54	3277
	Aldebaran E.	32 50 11	3231	31 24 38	3243	29 59 19	3255	28 34 15	3272
	SUN E.	63 57 41	3416	62 35 43	3411	61 13 39	3407	59 51 30	3400
3	α Aquilæ W.	104 3 1	3580	105 21 57	3582	106 40 51	3584	107 59 43	3587
	Fomalhaut W.	79 12 48	3454	80 34 4	3443	81 55 33	3431	83 17 14	3422
	α Pegasi W.	57 31 53	3307	58 57 54	3194	60 24 10	3181	61 50 42	3168
	SUN E.	52 59 2	3368	51 36 9	3360	50 13 7	3362	48 49 56	3344
4	Fomalhaut W.	90 8 30	3372	91 31 18	3364	92 54 16	3346	94 17 23	3347
	α Pegasi W.	69 7 13	3105	70 35 17	3093	72 3 35	3080	73 32 9	3066
	α Arietis W.	25 33 54	3033	27 3 26	3014	28 33 21	2997	30 3 37	2981
	SUN E.	41 51 26	3297	40 27 11	3297	39 2 44	3276	37 38 5	3265
5	Fomalhaut W.	101 15 12	3313	102 39 8	3307	104 3 11	3303	105 27 19	3299
	α Pegasi W.	80 58 43	3007	82 28 47	2996	83 59 5	2984	85 29 38	2973
	α Arietis W.	37 39 47	2998	39 11 56	2994	40 44 22	2981	42 17 5	2967
	SUN E.	30 31 37	3308	29 5 39	3198	27 39 27	3196	26 13 1	3173
9	SUN W.	17 21 1	2637	18 54 41	2637	20 28 34	2616	22 2 39	2606
	Saturn E.	31 55 15	2638	30 17 12	2639	28 39 10	2641	27 1 11	2646
	Spica E.	77 25 52	2626	75 45 14	2616	74 4 23	2607	72 23 20	2499
	Antares E.	123 5 26	2620	121 24 41	2611	119 43 43	2603	118 2 33	2483
10	SUN W.	29 56 1	2765	31 31 15	2757	33 6 39	2749	34 42 14	2741
	Spica E.	63 55 15	2460	62 13 5	2453	60 30 45	2446	58 48 16	2439
	Antares E.	109 33 45	2453	107 51 26	2445	106 8 56	2438	104 26 16	2431
11	SUN W.	42 42 35	2706	44 19 7	2700	45 55 47	2694	47 32 35	2687
	Spica E.	50 13 30	2408	48 30 7	2403	46 46 37	2396	45 2 59	2393
	Antares E.	95 50 27	2396	94 6 50	2392	92 23 4	2396	90 39 9	2390
12	SUN W.	55 38 36	2660	57 16 10	2655	58 53 51	2650	60 31 38	2645
	Jupiter W.	19 4 54	2639	20 45 15	2614	22 26 9	2494	24 7 30	2478
	Regulus W.	18 21 38	2460	20 3 47	2440	21 46 25	2424	23 29 26	2409
	Spica E.	36 23 14	2373	34 39 1	2371	32 54 44	2368	31 10 23	2366
	Antares E.	81 57 41	2365	80 13 1	2360	78 28 15	2346	76 43 22	2342
13	SUN W.	68 42 5	2624	70 20 27	2621	71 58 54	2617	73 37 26	2612
	Jupiter W.	32 38 52	2426	34 21 49	2419	36 4 57	2413	37 48 15	2406
	Regulus W.	32 8 58	2356	33 53 33	2351	35 38 18	2346	37 23 12	2339
	Saturn W.	24 2 17	2467	25 43 49	2467	27 25 48	2451	29 8 10	2436
	Antares E.	67 57 28	2322	66 12 0	2318	64 26 27	2315	62 40 50	2312
14	α Aquilæ E.	118 44 46	3026	117 15 5	3000	115 44 52	3077	114 14 10	2964
	SUN W.	81 51 17	2597	83 30 16	2595	85 9 18	2593	86 48 23	2591
	Jupiter W.	46 26 41	2392	48 10 42	2378	49 54 49	2374	51 39 1	2371

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	α Aquilæ W.	88° 16' 56"	3406	89° 35' 35"	3403	90° 54' 17"	3400	92° 13' 2"	3406
	Fomalhaut W.	63 15 25	3411	64 33 47	3406	65 52 27	3400	67 11 23	3406
	α Pegasi W.	40 42 40	3408	42 4 53	3381	43 27 31	3382	44 50 31	3344
	Aldebaran E.	38 34 7	3186	37 7 55	3204	35 41 51	3219	34 15 56	3220
	SUN E.	69 24 54	3420	68 3 11	3427	66 41 25	3423	65 19 35	3420
2	α Aquilæ W.	98 47 17	3461	100 6 12	3460	101 25 8	3479	102 44 5	3460
	Fomalhaut W.	73 49 51	3460	75 10 15	3468	76 30 53	3476	77 51 44	3464
	α Pegasi W.	51 50 32	3363	53 15 27	3248	54 40 39	3264	56 6 8	3220
	Aldebaran E.	27 9 31	3202	25 45 10	3316	24 21 16	3249	22 57 54	3279
	SUN E.	58 29 14	3265	57 6 52	3260	55 44 23	3262	54 21 46	3276
3	α Aquilæ W.	109 18 32	3500	110 37 18	3503	111 56 0	3508	113 14 37	3503
	Fomalhaut W.	84 39 6	3411	86 1 10	3400	87 23 26	3391	88 45 53	3382
	α Pegasi W.	63 17 30	3166	64 44 33	3142	66 11 51	3130	67 39 24	3117
	SUN E.	47 26 35	3325	46 3 4	3325	44 39 22	3317	43 15 30	3306
4	Fomalhaut W.	95 40 40	3380	97 4 6	3323	98 27 40	3326	99 51 22	3319
	α Pegasi W.	75 0 58	3066	76 30 2	3043	77 59 21	3092	79 28 54	3019
	α Arietis W.	31 34 13	2965	33 5 9	2961	34 36 23	2966	36 7 56	2923
	SUN E.	36 13 13	3255	34 48 9	3244	33 22 52	3223	31 57 21	3221
5	Fomalhaut W.	106 51 32	3266	108 15 49	3208	109 40 9	3291	111 4 31	3291
	α Pegasi W.	87 0 26	2961	88 31 28	2949	90 2 45	2966	91 34 16	2927
	α Arietis W.	43 50 6	2926	45 23 23	2842	46 56 57	2828	48 30 49	2816
	SUN E.	24 46 20	3162	23 19 25	3149	21 52 15	3137	20 24 50	3125
9	SUN W.	23 36 56	2790	25 11 25	2790	26 46 6	2782	28 20 58	2773
	Saturn E.	25 23 18	2664	23 45 36	2666	22 8 10	2663	20 31 6	2706
	Spica E.	70 42 6	2491	69 0 40	2482	67 19 2	2475	65 37 14	2467
	Antares E.	116 21 10	2485	114 39 36	2477	112 57 50	2469	111 15 53	2461
10	SUN W.	36 17 59	2734	37 53 54	2737	39 29 58	2719	41 6 12	2713
	Spica E.	57 5 37	2423	55 22 48	2426	53 39 51	2420	51 56 45	2414
	Antares E.	102 43 25	2424	101 0 25	2417	99 17 15	2411	97 33 56	2404
11	SUN W.	49 9 32	2681	50 46 37	2676	52 23 49	2670	54 1 9	2665
	Spica E.	43 19 14	2380	41 35 23	2384	39 51 25	2380	38 7 22	2377
	Antares E.	88 55 6	2375	87 10 56	2370	85 26 38	2366	83 42 13	2360
12	SUN W.	62 9 32	2640	63 47 32	2637	65 25 37	2628	67 3 48	2628
	Jupiter W.	25 49 14	2465	27 31 16	2466	29 13 33	2448	30 56 6	2434
	Regulus W.	25 12 48	2366	26 56 29	2365	26 40 25	2376	30 24 36	2365
	Spica E.	29 26 0	2365	27 41 35	2364	25 57 9	2366	24 12 44	2366
	Antares E.	74 58 23	2327	73 13 18	2323	71 28 7	2329	69 42 50	2326
13	SUN W.	75 16 4	2610	76 54 46	2607	78 33 32	2604	80 12 22	2600
	Jupiter W.	39 31 41	2401	41 15 15	2396	42 58 57	2390	44 42 46	2386
	Regulus W.	39 8 14	2326	40 53 23	2329	42 38 40	2326	44 24 3	2321
	Saturn W.	30 50 53	2424	32 33 54	2418	34 17 10	2404	36 0 39	2396
	Antares E.	60 55 8	2300	59 9 21	2306	57 23 30	2302	55 37 34	2300
14	α Aquilæ E.	112 43 0	2666	111 11 25	2617	109 39 28	2601	108 7 10	2666
	SUN W.	88 27 31	2660	90 6 42	2666	91 45 56	2664	93 25 13	2662
	Jupiter W.	53 23 18	2367	55 7 40	2365	56 52 5	2362	58 36 34	2360

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
14	Regulus W.	46° 9' 33"	2317	47° 55' 7"	2313	49° 40' 47"	2309	51° 26' 33"	2307
	Saturn W.	37 44 21	2367	39 28 14	2361	41 12 16	2375	42 56 27	2365
	Antares E.	53 51 35	2266	52 5 32	2306	50 19 26	2308	48 33 16	2291
	α Aquilæ E.	106 34 33	2373	105 1 39	2361	103 28 30	2351	101 55 8	2341
15	SUN W.	95 4 33	2560	96 43 55	2570	98 23 19	2578	100 2 44	2577
	Jupiter W.	60 21 6	2365	62 5 41	2365	63 50 19	2354	65 35 0	2352
	Regulus W.	60 16 23	2364	62 2 31	2360	63 48 42	2391	65 34 55	2369
	Saturn W.	51 39 11	2345	53 24 1	2345	55 8 55	2343	56 53 53	2340
	Antares E.	39 41 45	2263	37 55 20	2262	36 8 54	2261	34 22 27	2250
	α Aquilæ E.	94 5 38	2310	92 31 23	2307	90 57 4	2305	89 22 43	2305
16	SUN W.	108 20 12	2373	109 59 44	2374	111 39 15	2374	113 18 46	2374
	Regulus W.	74 26 30	2365	76 12 53	2364	77 59 16	2354	79 45 39	2365
	Jupiter W.	74 18 52	2345	76 3 42	2345	77 48 32	2345	79 33 22	2345
	Saturn W.	65 39 27	2332	67 24 40	2331	69 9 54	2331	70 55 8	2331
	Spica W.	20 28 5	2323	22 13 31	2315	23 59 7	2311	25 44 51	2306
	Antares E.	25 29 59	2260	23 43 30	2261	21 57 3	2263	20 10 29	2267
	α Aquilæ E.	81 31 11	2310	79 57 5	2308	78 23 7	2301	76 49 19	2303
	Fomalhaut E.	106 29 19	2736	104 53 29	2730	103 17 29	2724	101 41 21	2719
17	SUN W.	121 36 9	2379	123 15 33	2381	124 54 54	2383	126 34 12	2385
	Regulus W.	88 37 22	2365	90 23 39	2360	92 9 53	2391	93 56 5	2394
	Jupiter W.	88 17 22	2352	90 2 6	2354	91 46 47	2350	93 31 25	2346
	Saturn W.	79 41 18	2333	81 26 29	2335	83 11 38	2337	84 56 44	2339
	Spica W.	34 34 42	2397	36 20 46	2397	38 6 50	2396	39 52 53	2393
	α Aquilæ E.	69 3 36	2303	67 31 21	2300	65 59 28	2341	64 28 1	2303
	Fomalhaut E.	93 39 17	2705	92 2 45	2707	90 26 14	2708	88 49 45	2711
	α Pegasi E.	114 54 27	2447	113 11 59	2444	111 29 27	2442	109 46 52	2441
18	Regulus W.	102 46 6	2369	104 31 52	2313	106 17 33	2317	108 3 8	2321
	Jupiter W.	102 13 40	2373	103 57 53	2375	105 42 0	2363	107 26 1	2367
	Saturn W.	93 41 23	2363	95 26 5	2367	97 10 42	2361	98 55 13	2366
	Spica W.	48 42 40	2360	50 28 27	2311	52 14 10	2315	53 59 48	2316
	α Aquilæ E.	56 58 39	3111	55 30 43	3100	54 3 34	3103	52 37 17	3141
	Fomalhaut E.	80 48 40	2739	79 12 52	2745	77 37 16	2750	76 1 54	2769
	α Pegasi E.	101 13 44	2443	99 31 10	2445	97 48 39	2446	96 6 12	2450
19	Saturn W.	107 35 59	2368	109 19 44	2400	111 3 19	2407	112 46 44	2415
	Spica W.	62 46 27	2343	64 31 25	2345	66 16 14	2354	68 0 55	2361
	Antares W.	17 5 54	2349	18 50 42	2353	20 35 25	2357	22 20 2	2363
	α Aquilæ E.	45 41 42	2363	44 22 27	2349	43 4 45	2745	41 48 45	2351
	Fomalhaut E.	68 9 15	2345	66 35 46	2366	65 2 43	2367	63 30 7	2369
	α Pegasi E.	87 35 19	2475	85 53 31	2482	84 11 52	2480	82 30 24	2497
20	Spica W.	76 41 50	2366	78 25 28	2405	80 8 55	2415	81 52 9	2423
	Antares W.	31 0 57	2366	32 44 38	2403	34 26 8	2412	36 11 26	2421
	Fomalhaut E.	55 55 21	2050	54 26 22	2056	52 58 10	2123	51 30 47	2134
	α Pegasi E.	74 6 2	2345	72 25 51	2356	70 45 56	2368	69 6 17	2369
	α Arietis E.	116 45 28	2413	115 2 10	2419	113 19 3	2425	111 36 8	2436
21	Spica W.	90 25 2	2472	92 6 54	2483	93 48 31	2494	95 29 53	2505
	Antares W.	44 44 41	2480	46 26 38	2470	48 8 21	2480	49 49 49	2501
	Fomalhaut E.	44 28 55	2490	43 8 8	2556	41 48 46	2543	40 30 57	2737
	α Pegasi E.	60 52 43	2555	59 15 3	2573	57 37 47	2593	56 0 56	2711

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LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
14	Regulus W.	53° 12' 28"	2804	54° 58' 17"	2800	56° 44' 16"	2806	58° 30' 18"	2806
	Saturn W.	44 40 47	2804	46 25 14	2800	48 9 48	2806	49 54 27	2802
	Antares E.	46 47 3	2800	45 0 47	2807	43 14 29	2805	41 28 8	2804
	α Aquilæ E.	100 21 33	2808	98 47 47	2806	97 13 51	2819	95 39 48	2814
15	SUN W.	101 42 11	2876	103 21 40	2874	105 1 10	2874	106 40 41	2874
	Jupiter W.	67 19 44	2861	69 4 29	2860	70 49 15	2849	72 34 3	2848
	Regulus W.	67 21 11	2867	69 7 29	2867	70 53 48	2866	72 40 8	2866
	Saturn W.	58 38 54	2867	60 23 59	2866	62 9 6	2864	63 54 16	2863
	Antares E.	32 35 58	2860	30 49 29	2879	29 2 59	2879	27 16 29	2879
	α Aquilæ E.	87 48 21	2806	86 14 0	2806	84 39 40	2808	83 5 23	2812
16	SUN W.	114 58 17	2874	116 37 47	2876	118 17 16	2877	119 56 43	2877
	Regulus W.	81 32 1	2800	83 18 23	2806	85 4 44	2806	86 51 4	2807
	Jupiter W.	81 18 12	2846	83 3 1	2846	84 47 50	2840	86 32 37	2861
	Saturn W.	72 40 23	2831	74 25 38	2831	76 10 52	2831	77 56 6	2833
	Spica W.	27 30 42	2802	29 16 38	2800	31 2 37	2808	32 48 39	2806
	Antares E.	18 24 20	2802	16 36 9	2846	14 52 9	2811	13 6 25	2837
	α Aquilæ E.	75 15 41	2846	73 42 16	2800	72 9 6	2879	70 36 12	2867
	Fomalhaut E.	100 5 6	2713	98 26 44	2710	96 52 18	2707	95 15 48	2707
17	SUN W.	128 13 27	2806	129 52 39	2801	131 31 47	2804	133 10 50	2806
	Regulus W.	95 42 13	2806	97 26 18	2809	99 14 19	2802	101 0 15	2806
	Jupiter W.	95 16 0	2800	97 0 32	2804	98 44 59	2806	100 29 22	2870
	Saturn W.	86 41 47	2841	88 26 47	2844	90 11 43	2846	91 56 35	2849
	Spica W.	41 38 55	2800	43 24 55	2801	45 10 53	2803	46 56 48	2806
	α Aquilæ E.	62 57 2	2807	61 26 33	2014	59 56 38	2043	58 27 19	2076
	Fomalhaut E.	87 13 20	2714	85 36 59	2719	84 0 45	2736	82 24 38	2732
	α Pegasi E.	108 4 15	2440	106 21 37	2440	104 38 59	2440	102 56 21	2441
18	Regulus W.	109 48 37	2806	111 33 59	2831	113 19 13	2837	115 4 19	2843
	Jupiter W.	109 9 55	2801	110 53 42	2800	112 37 22	2402	114 20 54	2406
	Saturn W.	100 39 37	2871	102 23 54	2876	104 8 4	2861	105 52 6	2867
	Spica W.	55 45 21	2803	57 30 48	2827	59 16 8	2832	61 1 21	2837
	α Aquilæ E.	51 11 56	2808	49 47 36	2801	48 24 24	2416	47 2 24	2404
	Fomalhaut E.	74 26 46	2703	72 51 55	2706	71 17 22	2811	69 43 8	2837
19	α Pegasi E.	94 23 49	2464	92 41 31	2409	90 59 20	2464	89 17 16	2460
	Saturn W.	114 29 58	2423	116 13 1	2481	117 55 52	2480	119 38 31	2448
	Spica W.	69 45 26	2806	71 29 47	2874	73 13 59	2862	74 58 0	2800
	Antares W.	24 4 31	2800	25 48 51	2874	27 33 3	2861	29 17 5	2866
	α Aquilæ E.	40 34 36	2873	39 22 29	4106	38 12 33	4208	37 5 1	4428
	Fomalhaut E.	61 58 0	2806	60 26 25	2803	58 55 25	2808	57 25 3	2025
20	α Pegasi E.	80 49 7	2406	79 8 1	2616	77 27 8	2694	75 46 28	2634
	Spica W.	83 35 11	2438	85 17 59	2443	87 0 34	2482	88 42 55	2402
	Antares W.	37 54 31	2480	39 37 24	2480	41 20 3	2448	43 2 29	2460
	Fomalhaut E.	50 4 19	2808	48 38 49	2807	47 14 22	2846	45 51 2	2408
	α Pegasi E.	67 26 55	2404	65 47 52	2806	64 9 8	2824	62 30 45	2680
	α Arietis E.	109 53 24	2444	108 10 53	2464	106 28 36	2464	104 46 32	2474
21	Spica W.	97 10 59	2617	98 51 49	2808	100 32 23	2640	102 12 41	2651
	Antares W.	51 31 1	2613	53 11 57	2628	54 52 38	2636	56 33 3	2647
	Fomalhaut E.	39 14 49	2643	38 0 31	2606	36 48 11	4080	35 38 0	4287
	α Pegasi E.	54 24 31	2723	52 48 33	2753	51 13 3	2776	49 38 4	2800

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LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
21	α Arietis E.	103° 4' 42"	2484	101° 23' 6"	2484	99° 41' 44"	2504	98° 0' 37"	2516
22	Spica W.	103 52 43	2564	105 32 27	2576	107 11 55	2600	108 51 5	2601
	Antares W.	58 13 11	2600	59 53 2	2673	61 32 36	2663	63 11 54	2606
	α Pegasi E.	48 3 36	2626	46 29 42	2664	44 56 24	2683	43 23 43	2616
	α Arietis E.	89 39 0	2674	87 59 30	2667	86 20 17	2669	84 41 20	2611
23	Antares W.	71 24 5	2680	73 1 38	2673	74 38 54	2687	76 15 52	2689
	α Arietis E.	76 30 59	2677	74 58 48	2680	73 16 54	2704	71 40 19	2717
	Aldebaran E.	109 9 5	2713	107 32 41	2734	105 56 33	2736	104 20 41	2748
24	Antares W.	84 16 23	2764	85 51 38	2777	87 26 36	2790	89 1 17	2808
	α Aquilæ W.	39 29 2	2808	40 34 52	2809	41 42 3	2800	42 50 29	4181
	α Arietis E.	63 41 53	2786	62 7 5	2796	60 32 35	2613	58 58 23	2626
	Aldebaran E.	96 25 30	2611	94 51 17	2626	93 17 21	2638	91 43 42	2640
25	Antares W.	96 50 35	2666	98 23 39	2676	99 56 28	2687	101 29 3	2689
	α Aquilæ W.	48 47 10	2664	50 0 46	2660	51 14 57	2619	52 29 40	2723
	α Arietis E.	51 11 42	2692	49 39 13	2606	48 7 1	2618	46 35 5	2621
	Aldebaran E.	83 59 26	2613	82 27 22	2604	80 55 33	2636	79 24 0	2647
	SUN E.	137 53 14	2218	136 27 20	2226	135 1 41	2237	133 36 16	2260
26	Antares W.	109 8 27	2663	110 39 40	2669	112 10 41	2670	113 41 31	2679
	α Aquilæ W.	58 49 11	2697	60 6 1	2696	61 23 4	2673	62 40 20	2693
	α Arietis E.	38 59 30	2606	37 29 11	2606	35 59 8	2621	34 29 21	2604
	Aldebaran E.	71 49 49	2604	70 19 41	2614	68 49 46	2634	67 20 3	2604
	SUN E.	126 32 40	2306	125 8 36	2317	123 44 44	2326	122 21 3	2326
27	α Aquilæ W.	69 8 58	2638	70 27 2	2628	71 45 12	2619	73 3 26	2616
	Fomalhaut W.	44 45 44	2603	45 58 1	2621	47 10 59	2685	48 24 34	2622
	Aldebaran E.	59 54 32	2692	58 26 0	2691	56 57 39	2699	55 29 23	2706
	SUN E.	115 25 17	2379	114 2 37	2386	112 40 4	2393	111 17 39	2398
28	α Aquilæ W.	79 35 24	2664	80 53 54	2668	82 12 26	2601	83 30 59	2602
	Fomalhaut W.	54 40 5	2734	55 56 27	2706	57 13 9	2696	58 30 11	2698
	α Pegasi W.	31 48 49	2698	33 7 31	2656	34 26 55	2621	35 46 56	2492
	Aldebaran E.	48 11 2	2147	46 43 49	2164	45 16 45	2162	43 49 50	2170
	SUN E.	104 27 10	2426	103 5 20	2427	101 43 34	2430	100 21 51	2423
29	α Aquilæ W.	90 3 57	2686	91 22 34	2686	92 41 11	2696	93 59 48	2698
	Fomalhaut W.	64 59 40	2696	66 18 19	2694	67 37 11	2671	68 56 17	2666
	α Pegasi W.	42 34 13	2692	43 56 50	2685	45 19 47	2649	46 43 2	2323
	Aldebaran E.	36 37 38	2211	35 11 42	2223	33 45 59	2223	32 20 29	2346
	SUN E.	93 33 47	2497	92 12 12	2496	90 50 36	2434	89 28 58	2423
30	α Aquilæ W.	100 32 45	2692	101 51 17	2692	103 9 48	2605	104 28 17	2607
	Fomalhaut W.	75 34 52	2606	76 55 10	2496	78 15 39	2486	79 36 19	2476
	α Pegasi W.	53 43 27	2367	55 8 17	2364	56 33 22	2642	57 58 41	2621
	SUN E.	82 40 9	2416	81 18 11	2411	79 56 7	2406	78 33 57	2406
31	Fomalhaut W.	86 22 21	2429	87 44 5	2420	89 5 59	2412	90 28 2	2403
	α Pegasi W.	65 8 48	2171	66 35 32	2160	68 2 30	2147	69 29 43	2126
	α Arietis W.	21 32 13	2124	22 59 54	2101	24 28 2	2081	25 56 35	2069
	SUN E.	71 41 17	2364	70 18 19	2364	68 55 11	2345	67 31 52	2336

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Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DM.	XVh.	P. L. of DM.	XVIIIh.	P. L. of DM.	XXIh.	P. L. of DM.
21	α Arietis E.	96° 19' 46"	2037	94° 39' 11"	2038	92° 58' 51"	2040	91° 18' 47"	2042
22	Spica W.	110 29 58	2014	112 8 34	2027	113 46 52	2040	115 24 52	2044
	Antares W.	64 50 55	2008	66 29 39	2021	68 8 5	2034	69 46 14	2047
	α Pegasi E.	41 51 43	2040	40 20 26	2026	38 49 55	2024	37 20 13	2006
	α Arietis E.	83 2 40	2024	81 24 18	2026	79 46 14	2051	78 8 28	2063
23	Antares W.	77 52 33	2713	79 28 56	2726	81 5 2	2738	82 40 51	2761
	α Arietis E.	70 4 2	2781	68 26 3	2744	66 52 22	2756	65 16 59	2771
	Aldebaran E.	102 45 6	2761	101 9 47	2774	99 34 45	2796	97 59 59	2799
24	Antares W.	90 35 41	2615	92 9 49	2628	93 43 40	2641	95 17 15	2662
	α Aquilæ W.	44 0 1	4000	45 10 33	4014	46 21 59	3965	47 34 13	3923
	α Arietis E.	57 24 28	2680	55 50 51	2662	54 17 31	2666	52 44 28	2670
	Aldebaran E.	90 10 19	2692	88 37 12	2675	87 4 21	2687	85 31 46	2690
25	Antares W.	103 1 23	2910	104 33 29	2920	106 5 22	2931	107 37 1	2942
	α Aquilæ W.	53 44 50	3708	55 0 25	3748	56 16 21	3729	57 32 37	3713
	α Arietis E.	45 3 26	2044	43 32 3	2067	42 0 56	2069	40 30 5	2062
	Aldebaran E.	77 52 41	2060	76 21 37	2070	74 50 47	2061	73 20 11	2063
	SUN E.	132 11 6	2092	130 46 10	2078	129 21 27	2084	127 56 57	2095
26	Antares W.	115 12 10	2808	116 42 38	2808	118 12 56	2808	119 43 5	2810
	α Aquilæ W.	63 57 47	3064	65 15 23	3047	66 33 7	3039	67 50 59	3033
	α Arietis E.	32 59 50	3047	31 30 36	3000	30 1 38	3078	28 32 58	3081
	Aldebaran E.	65 50 33	3044	64 21 15	3064	62 52 9	3064	61 23 15	3073
	SUN E.	120 57 33	3045	119 34 14	3064	118 11 5	3063	116 48 6	3072
27	α Aquilæ W.	74 21 44	3612	75 40 5	3610	76 58 29	3608	78 16 55	3606
	Fomalhaut W.	49 38 43	3621	50 53 23	3704	52 8 31	3708	53 24 6	3746
	Aldebaran E.	54 1 28	3115	52 33 37	3134	51 5 56	3131	49 38 24	3130
	SUN E.	109 55 21	3406	108 33 10	3410	107 11 5	3416	105 49 5	3419
28	α Aquilæ W.	84 49 33	3609	86 8 8	3606	87 26 44	3596	88 45 20	3606
	Fomalhaut W.	59 47 32	3602	61 5 10	3636	62 23 5	3623	63 41 15	3606
	α Pegasi W.	37 7 29	3465	38 26 32	3441	39 50 2	3430	41 11 56	3400
	Aldebaran E.	42 23 5	3178	40 56 29	3168	39 30 2	3193	38 3 45	3202
	SUN E.	99 0 12	3434	97 38 34	3435	96 16 57	3437	94 55 22	3437
29	α Aquilæ W.	95 18 25	3606	96 37 1	3606	97 55 37	3599	99 14 12	3601
	Fomalhaut W.	70 15 36	3640	71 35 7	3687	72 54 50	3636	74 14 45	3615
	α Pegasi W.	48 6 35	3610	49 30 25	3606	50 54 30	3592	52 18 51	3579
	Aldebaran E.	30 55 13	3259	29 30 13	3276	28 5 33	3294	26 41 14	3316
	SUN E.	88 7 19	3431	86 45 37	3437	85 23 51	3424	84 2 2	3421
30	α Aquilæ W.	105 46 44	3610	107 5 8	3613	108 23 28	3616	109 41 45	3621
	Fomalhaut W.	80 57 10	3406	82 18 12	3467	83 39 24	3447	85 0 47	3436
	α Pegasi W.	59 24 14	3219	60 50 1	3207	62 16 2	3194	63 42 18	3188
	SUN E.	77 11 41	3064	75 49 18	3066	74 26 46	3079	73 4 6	3072
31	Fomalhaut W.	91 50 16	3393	93 12 40	3386	94 35 13	3377	95 57 56	3369
	α Pegasi W.	70 57 10	3123	72 24 52	3110	73 52 49	3097	75 21 2	3085
	α Arietis W.	27 25 31	2044	28 54 49	2027	30 24 28	2011	31 54 27	2005
	SUN E.	66 8 22	2026	64 44 41	2016	63 20 47	2006	61 56 41	2004

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to		Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	subtracted from Apparent Time.				
Thur.	1	^h 8 ^m 46 ^s 20.17	9.708	N. 17° 58' 56".1	37.95	15 48.10	66.64	^m 6 ^s 0.55	0.147		
Fri.	2	8 50 12.88	9.685	17 43 36.5	38.68	15 48.22	66.55	5 56.71	0.171		
Sat.	3	8 54 5.00	9.660	17 27 59.6	39.39	15 48.35	66.46	5 52.27	0.196		
Sun.	4	8 57 56.52	9.635	17 12 5.6	40.10	15 48.48	66.37	5 47.25	0.221		
Mon.	5	9 1 47.44	9.610	16 55 54.8	40.79	15 48.62	66.28	5 41.62	0.246		
Tues.	6	9 5 37.76	9.585	16 39 27.5	41.47	15 48.77	66.19	5 35.41	0.271		
Wed.	7	9 9 27.50	9.561	16 22 43.9	42.14	15 48.92	66.11	5 28.61	0.296		
Thur.	8	9 13 16.65	9.536	16 5 44.6	42.79	15 49.08	66.03	5 21.22	0.320		
Fri.	9	9 17 5.21	9.512	15 48 29.9	43.43	15 49.25	65.94	5 13.24	0.345		
Sat.	10	9 20 53.18	9.487	15 31 0.0	44.05	15 49.42	65.86	5 4.68	0.369		
Sun.	11	9 24 40.55	9.463	15 13 15.3	44.67	15 49.59	65.78	4 55.52	0.393		
Mon.	12	9 28 27.34	9.438	14 55 16.1	45.27	15 49.76	65.70	4 45.78	0.417		
Tues.	13	9 32 13.56	9.416	14 37 2.7	45.86	15 49.94	65.62	4 35.48	0.441		
Wed.	14	9 35 59.22	9.392	14 18 35.3	46.43	15 50.13	65.54	4 24.61	0.464		
Thur.	15	9 39 44.32	9.369	13 59 54.5	46.98	15 50.32	65.46	4 13.19	0.487		
Fri.	16	9 43 28.87	9.346	13 41 0.4	47.53	15 50.51	65.38	4 1.22	0.510		
Sat.	17	9 47 12.90	9.325	13 21 53.2	48.07	15 50.70	65.31	3 48.72	0.532		
Sun.	18	9 50 56.41	9.304	13 2 33.4	48.59	15 50.89	65.24	3 35.71	0.553		
Mon.	19	9 54 39.42	9.283	12 43 1.2	49.10	15 51.08	65.17	3 22.20	0.573		
Tues.	20	9 58 21.93	9.263	12 23 17.1	49.59	15 51.28	65.10	3 8.20	0.593		
Wed.	21	10 2 3.96	9.243	12 3 21.1	50.08	15 51.48	65.03	2 53.71	0.613		
Thur.	22	10 5 45.54	9.224	11 43 13.5	50.56	15 51.68	64.96	2 38.78	0.632		
Fri.	23	10 9 26.67	9.206	11 22 54.8	51.02	15 51.88	64.90	2 23.39	0.650		
Sat.	24	10 13 7.37	9.189	11 2 25.1	51.46	15 52.09	64.84	2 7.58	0.667		
Sun.	25	10 16 47.67	9.172	10 41 44.8	51.90	15 52.30	64.78	1 51.37	0.684		
Mon.	26	10 20 27.59	9.156	10 20 54.1	52.33	15 52.51	64.72	1 34.77	0.700		
Tues.	27	10 24 7.13	9.142	9 59 53.5	52.73	15 52.72	64.66	1 17.82	0.715		
Wed.	28	10 27 46.31	9.128	9 38 43.3	53.13	15 52.93	64.61	1 0.50	0.729		
Thur.	29	10 31 25.16	9.113	9 17 23.7	53.52	15 53.15	64.56	0 42.84	0.743		
Fri.	30	10 35 3.68	9.100	8 55 55.2	53.88	15 53.37	64.51	0 24.85	0.757		
Sat.	31	10 38 41.87	9.087	8 34 18.0	54.24	15 53.59	64.46	0 6.53	0.770		
Sun.	32	10 42 19.77	9.075	N. 8 12 32.3	54.58	15 53.82	64.41	0 12.06	0.781		

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	added to Mean Time.			
						m s			
Thur.	1	h m s 8 46 19.22	s 9.708	N. 17° 56' 59.9"	s 37.95	m s 6 0.56	s 0.147	h m s 8 40 18.66	
Fri.	2	8 50 11.94	9.685	17 43 40.3	38.68	5 56.72	0.171	8 44 15.22	
Sat.	3	8 54 4.07	9.660	17 28 3.4	39.39	5 52.29	0.196	8 48 11.78	
Sun.	4	8 57 55.60	9.635	17 12 9.4	40.10	5 47.27	0.221	8 52 8.33	
Mon.	5	9 1 46.53	9.610	16 55 58.6	40.79	5 41.64	0.246	8 56 4.89	
Tues.	6	9 5 36.87	9.585	16 39 31.3	41.47	5 35.43	0.271	9 0 1.44	
Wed.	7	9 9 26.63	9.561	16 22 47.7	42.14	5 28.63	0.296	9 3 58.00	
Thur.	8	9 13 15.80	9.536	16 5 48.4	42.79	5 21.25	0.320	9 7 54.55	
Fri.	9	9 17 4.38	9.512	15 48 33.7	43.43	5 13.27	0.345	9 11 51.11	
Sat.	10	9 20 52.37	9.487	15 31 3.8	44.05	5 4.71	0.369	9 15 47.66	
Sun.	11	9 24 39.77	9.463	15 13 19.1	44.65	4 55.55	0.393	9 19 44.22	
Mon.	12	9 28 26.59	9.438	14 55 19.8	45.27	4 45.81	0.417	9 23 40.78	
Tues.	13	9 32 12.84	9.416	14 37 6.2	45.86	4 35.51	0.441	9 27 37.33	
Wed.	14	9 35 58.53	9.392	14 18 38.7	46.43	4 24.64	0.464	9 31 33.89	
Thur.	15	9 39 43.66	9.369	13 59 57.8	46.98	4 13.22	0.487	9 35 30.44	
Fri.	16	9 43 28.24	9.346	13 41 3.6	47.53	4 1.25	0.510	9 39 26.99	
Sat.	17	9 47 12.30	9.325	13 21 56.3	48.07	3 48.75	0.532	9 43 23.55	
Sun.	18	9 50 55.85	9.304	13 2 36.3	48.59	3 35.74	0.553	9 47 20.11	
Mon.	19	9 54 38.89	9.283	12 43 4.0	49.10	3 22.23	0.573	9 51 16.66	
Tues.	20	9 58 21.44	9.263	12 23 19.7	49.59	3 8.23	0.593	9 55 13.21	
Wed.	21	10 2 3.51	9.243	12 3 23.5	50.08	2 53.74	0.613	9 59 9.77	
Thur.	22	10 5 45.18	9.224	11 43 15.7	50.56	2 38.81	0.632	10 3 6.32	
Fri.	23	10 9 26.30	9.206	11 22 56.8	51.02	2 23.42	0.650	10 7 2.88	
Sat.	24	10 13 7.04	9.180	11 2 26.9	51.46	2 7.61	0.667	10 10 59.43	
Sun.	25	10 16 47.38	9.172	10 41 46.4	51.90	1 51.40	0.684	10 14 55.98	
Mon.	26	10 20 27.34	9.156	10 20 55.5	52.33	1 34.80	0.700	10 18 52.54	
Tues.	27	10 24 6.93	9.149	9 59 54.7	52.73	1 17.84	0.715	10 22 49.09	
Wed.	28	10 27 46.16	9.128	9 38 44.2	53.13	1 0.51	0.729	10 26 45.65	
Thur.	29	10 31 25.05	9.113	9 17 24.4	53.52	0 42.85	0.743	10 30 42.20	
Fri.	30	10 35 3.61	9.100	8 55 55.6	53.88	0 24.86	0.757	10 34 38.75	
Sat.	31	10 38 41.85	9.087	8 34 18.1	54.24	0 6.54	0.770	10 38 35.31	
Sun.	32	10 42 19.80	9.075	N. 8 12 32.1	54.58	0 12.06	0.781	10 42 31.86	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	213	129° 8' 51.1"	8' 3.8"	143.62	+0.58	0.0063214	23.8	15 17 10.67	
2	214	130 6 18.6	5 31.2	143.67	0.45	.0062634	24.7	15 13 14.75	
3	215	131 3 47.2	2 59.7	143.71	0.32	.0062032	25.6	15 9 18.84	
4	216	132 1 16.9	0 29.2	143.75	0.19	.0061407	26.5	15 5 22.93	
5	217	132 58 47.8	57 59.9	143.79	+0.06	.0060759	27.5	15 1 27.02	
6	218	133 56 19.9	55 31.9	143.83	-0.05	.0060088	28.4	14 57 31.11	
7	219	134 53 53.0	53 4.8	143.88	0.15	.0059393	29.4	14 53 35.21	
8	220	135 51 27.1	50 38.8	143.93	0.23	.0058675	30.3	14 49 39.30	
9	221	136 49 2.2	48 13.7	143.97	0.29	.0057934	31.3	14 45 43.39	
10	222	137 46 38.2	45 49.5	144.01	0.31	.0057172	32.1	14 41 47.48	
11	223	138 44 15.3	43 26.5	144.05	0.29	.0056390	32.9	14 37 51.57	
12	224	139 41 53.4	41 4.5	144.10	0.24	.0055589	33.7	14 33 55.66	
13	225	140 39 32.5	38 43.5	144.15	0.18	.0054770	34.4	14 29 59.75	
14	226	141 37 12.5	36 23.3	144.19	-0.09	.0053935	35.1	14 26 3.84	
15	227	142 34 53.5	34 4.2	144.23	+0.03	.0053086	35.6	14 22 7.93	
16	228	143 32 35.7	31 46.3	144.27	0.15	.0052223	36.1	14 18 12.02	
17	229	144 30 18.9	29 29.4	144.32	0.29	.0051349	36.6	14 14 16.11	
18	230	145 28 3.2	27 13.6	144.37	0.42	.0050464	37.1	14 10 20.20	
19	231	146 25 48.8	24 59.0	144.43	0.53	.0049569	37.7	14 6 24.29	
20	232	147 23 35.8	22 45.9	144.49	0.63	.0048665	38.0	14 2 28.38	
21	233	148 21 24.2	20 34.2	144.55	0.72	.0047753	38.3	13 58 32.47	
22	234	149 19 14.0	18 23.9	144.61	0.77	.0046834	38.6	13 54 36.57	
23	235	150 17 5.4	16 15.2	144.68	0.80	.0045906	38.9	13 50 40.66	
24	236	151 14 58.5	14 8.1	144.75	0.80	.0044969	39.2	13 46 44.75	
25	237	152 12 53.4	12 2.9	144.82	0.77	.0044023	39.6	13 42 48.84	
26	238	153 10 50.0	9 59.4	144.90	0.72	.0043067	40.0	13 38 52.93	
27	239	154 8 48.5	7 57.8	144.98	0.63	.0042100	40.4	13 34 57.03	
28	240	155 6 49.0	5 58.2	145.06	0.51	.0041122	40.9	13 31 1.12	
29	241	156 4 51.2	4 0.2	145.14	0.38	.0040132	41.4	13 27 5.21	
30	242	157 2 55.4	2 4.3	145.22	0.25	.0039129	42.0	13 23 9.30	
31	243	158 1 1.5	0 10.3	145.30	+0.12	.0038111	42.7	13 19 13.39	
32	244	158 59 9.5	58 18.2	145.38	-0.01	0.0037078	43.3	13 15 17.49	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

THE MOON'S										
Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	Diff. for 1 hour.			
							h	m		
1	15' 1.9	15' 6.3	55' 3.4	+1.25	55' 19.4	+1.41	20	28.3	2.21	24.4
2	15 11.1	15 16.3	55 37.1	1.54	55 56.3	1.64	21	21.9	2.24	25.4
3	15 21.8	15 27.6	56 16.6	1.72	56 37.6	1.77	22	15.7	2.23	26.4
4	15 33.4	15 39.2	56 59.0	1.78	57 20.4	1.76	23	8.8	2.19	27.4
5	15 44.9	15 50.4	57 41.8	1.71	58 1.3	1.62	♄			28.4
6	15 55.5	16 0.2	58 20.1	1.50	58 37.4	1.36	0	0.6	2.13	0.0
7	16 4.4	16 8.0	58 52.7	1.19	59 5.9	1.01	0	51.1	2.08	1.0
8	16 10.9	16 13.2	59 16.9	0.81	59 25.4	0.61	1	40.7	2.06	2.0
9	16 14.9	16 16.0	59 31.6	0.41	59 35.4	+0.22	2	30.3	2.08	3.0
10	16 16.4	16 16.2	59 36.9	+0.04	59 36.3	-0.13	3	20.9	2.14	4.0
11	16 15.5	16 14.4	59 33.8	-0.28	59 29.5	0.42	4	13.3	2.23	5.0
12	16 12.8	16 10.9	59 23.7	0.54	59 16.5	0.64	5	8.2	2.34	6.0
13	16 8.6	16 6.1	59 8.2	0.73	58 58.9	0.81	6	5.7	2.44	7.0
14	16 3.3	16 0.3	58 48.8	0.88	58 37.8	0.94	7	5.0	2.48	8.0
15	15 57.1	15 53.8	58 26.2	1.00	58 13.9	1.05	8	4.4	2.45	9.0
16	15 50.8	15 46.6	58 0.9	1.10	57 47.4	1.15	9	2.1	2.35	10.0
17	15 42.8	15 38.8	57 33.3	1.19	57 18.8	1.23	9	56.8	2.21	11.0
18	15 34.7	15 30.5	57 3.9	1.26	56 48.6	1.28	10	48.0	2.05	12.0
19	15 26.3	15 22.1	56 33.1	1.30	56 17.5	1.30	11	35.6	1.92	13.0
20	15 17.9	15 13.7	56 2.0	1.29	55 46.6	1.27	12	20.4	1.82	14.0
21	15 9.6	15 5.7	55 31.6	1.22	55 17.2	1.16	13	3.3	1.76	15.0
22	15 2.0	14 58.6	55 3.7	1.09	54 51.2	1.00	13	45.2	1.74	16.0
23	14 55.6	14 52.9	54 39.9	0.88	54 30.2	0.74	14	27.0	1.75	17.0
24	14 50.7	14 49.0	54 22.1	0.59	54 15.9	0.43	15	9.5	1.80	18.0
25	14 47.9	14 47.4	54 11.8	-0.25	54 9.9	-0.06	15	53.4	1.87	19.0
26	14 47.5	14 48.3	54 10.3	+0.14	54 13.2	+0.35	16	39.4	1.96	20.0
27	14 49.7	14 51.9	54 18.6	0.56	54 26.6	0.77	17	27.6	2.06	21.0
28	14 54.8	14 58.3	54 37.2	0.98	54 50.2	1.19	18	18.0	2.14	22.0
29	15 2.5	15 7.4	55 5.7	1.39	55 23.5	1.57	19	10.1	2.19	23.0
30	15 12.8	15 18.7	55 43.4	1.74	56 5.2	1.88	20	3.0	2.21	24.0
31	15 25.1	15 31.8	56 28.6	2.00	56 53.2	2.09	20	55.9	2.19	25.0
32	15 38.8	15 45.8	57 18.6	+2.13	57 44.4	+2.14	21	48.1	2.16	26.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	4 25 37.01	2.3248	N.24 42 41.5	2.3986	0	6 15 44.94	2.3284	N.24 18 2.6	2.749
1	4 27 51.20	2.3262	24 45 13.7	2.476	1	6 18 4.65	2.3266	24 14 13.6	2.886
2	4 30 5.59	2.3416	24 47 38.6	2.553	2	6 20 24.37	2.3288	24 10 16.3	4.023
3	4 32 20.18	2.3448	24 49 56.1	2.229	3	6 22 44.10	2.3269	24 6 10.8	4.160
4	4 34 34.97	2.3460	24 52 6.1	2.105	4	6 25 3.84	2.3269	24 1 57.1	4.297
5	4 36 49.95	2.3512	24 54 8.7	1.980	5	6 27 23.57	2.3288	23 57 35.2	4.433
6	4 39 5.12	2.3544	24 56 3.8	1.855	6	6 29 43.30	2.3267	23 53 5.1	4.569
7	4 41 20.48	2.3576	24 57 51.3	1.729	7	6 32 3.02	2.3285	23 48 26.9	4.706
8	4 43 36.02	2.3605	24 59 31.3	1.603	8	6 34 22.72	2.3263	23 43 40.5	4.841
9	4 45 51.74	2.3635	25 1 3.7	1.476	9	6 36 42.41	2.3280	23 38 45.9	4.977
10	4 48 7.64	2.3664	25 2 28.4	1.349	10	6 39 2.08	2.3276	23 33 43.2	5.112
11	4 50 23.71	2.3692	25 3 45.5	1.223	11	6 41 21.72	2.3271	23 28 32.4	5.247
12	4 52 39.95	2.3720	25 4 55.0	1.094	12	6 43 41.33	2.3266	23 23 13.5	5.382
13	4 54 56.36	2.3748	25 5 56.7	0.965	13	6 46 0.91	2.3260	23 17 46.5	5.517
14	4 57 12.93	2.3775	25 6 50.7	0.836	14	6 48 20.45	2.3253	23 12 11.4	5.652
15	4 59 29.66	2.3802	25 7 36.9	0.706	15	6 50 39.95	2.3246	23 6 28.3	5.786
16	5 1 46.55	2.3828	25 8 15.4	0.576	16	6 52 59.40	2.3238	23 0 37.1	5.920
17	5 4 3.59	2.3853	25 8 46.0	0.445	17	6 55 18.81	2.3230	22 54 37.9	6.053
18	5 6 20.78	2.3877	25 9 8.8	0.314	18	6 57 38.16	2.3221	22 48 30.7	6.186
19	5 8 38.11	2.3900	25 9 23.7	0.182	19	6 59 57.45	2.3211	22 42 15.5	6.319
20	5 10 55.58	2.3923	25 9 30.6	0.050	20	7 2 16.69	2.3201	22 35 52.4	6.451
21	5 13 13.19	2.3946	25 9 29.6	0.083	21	7 4 35.87	2.3190	22 29 21.3	6.583
22	5 15 30.93	2.3968	25 9 20.7	0.216	22	7 6 54.98	2.3179	22 22 42.4	6.714
23	5 17 48.80	2.3989	N.25 9 3.8	0.349	23	7 9 14.02	2.3167	N.22 15 55.6	6.846
FRIDAY 2.					SUNDAY 4.				
0	5 20 6.80	2.3999	N.25 8 38.9	0.482	0	7 11 32.99	2.3155	N.22 9 1.0	6.975
1	5 22 24.92	2.3929	25 8 6.0	0.616	1	7 13 51.88	2.3143	22 1 58.6	7.106
2	5 24 43.15	2.3948	25 7 25.0	0.750	2	7 16 10.70	2.3129	21 54 48.4	7.236
3	5 27 1.49	2.3966	25 6 36.0	0.884	3	7 18 29.43	2.3115	21 47 30.5	7.363
4	5 29 19.94	2.3984	25 5 38.9	1.019	4	7 20 48.08	2.3101	21 40 4.8	7.491
5	5 31 38.50	2.3101	25 4 33.7	1.154	5	7 23 6.64	2.3086	21 32 31.5	7.619
6	5 33 57.15	2.3117	25 3 20.4	1.289	6	7 25 25.11	2.3071	21 24 50.5	7.746
7	5 36 15.90	2.3133	25 1 59.0	1.425	7	7 27 43.49	2.3055	21 17 2.0	7.872
8	5 38 34.74	2.3148	25 0 29.5	1.561	8	7 30 1.77	2.3039	21 9 5.9	7.998
9	5 40 53.67	2.3162	24 58 51.8	1.697	9	7 32 19.96	2.3023	21 1 2.3	8.123
10	5 43 12.68	2.3175	24 57 5.9	1.833	10	7 34 38.04	2.3006	20 52 51.2	8.247
11	5 45 31.76	2.3187	24 55 11.9	1.969	11	7 36 56.02	2.2988	20 44 32.7	8.370
12	5 47 50.92	2.3199	24 53 9.7	2.105	12	7 39 13.89	2.2970	20 36 6.8	8.492
13	5 50 10.15	2.3210	24 50 59.3	2.242	13	7 41 31.65	2.2952	20 27 33.5	8.615
14	5 52 29.44	2.3220	24 48 40.7	2.378	14	7 43 49.31	2.2934	20 18 52.9	8.737
15	5 54 48.79	2.3230	24 46 13.9	2.515	15	7 46 6.86	2.2915	20 10 5.0	8.858
16	5 57 8.20	2.3239	24 43 38.9	2.652	16	7 48 24.29	2.2896	20 1 9.9	8.978
17	5 59 27.66	2.3247	24 40 55.7	2.789	17	7 50 41.61	2.2877	19 52 7.6	9.097
18	6 1 47.17	2.3254	24 38 4.2	2.926	18	7 52 58.81	2.2857	19 42 58.2	9.216
19	6 4 6.72	2.3261	24 35 4.5	3.063	19	7 55 15.89	2.2837	19 33 41.7	9.334
20	6 6 26.30	2.3267	24 31 56.6	3.200	20	7 57 32.85	2.2817	19 24 18.1	9.451
21	6 8 45.92	2.3273	24 28 40.4	3.336	21	7 59 49.69	2.2796	19 14 47.5	9.567
22	6 11 5.57	2.3277	24 25 16.0	3.473	22	8 2 6.40	2.2775	19 5 10.0	9.682
23	6 13 25.24	2.3281	24 21 43.4	3.612	23	8 4 22.99	2.2754	18 55 25.6	9.796
24	6 15 44.94	2.3284	N.24 18 2.6	3.749	24	8 6 39.46	2.2733	N.18 45 34.4	9.909

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	8 6 39.46	2.9783	N. 18° 45' 34.4"	9.909	0	9 53 19.23	2.1768	N. 8° 59' 10.2"	14.071
1	8 8 55.80	2.9712	18 35 36.4	10.022	1	9 55 29.80	2.1764	8 45 4.2	14.127
2	8 11 12.01	2.9691	18 25 31.7	10.134	2	9 57 40.28	2.1741	8 30 54.9	14.182
3	8 13 28.09	2.9669	18 15 20.4	10.244	3	9 59 50.69	2.1738	8 16 42.4	14.235
4	8 15 44.04	2.9646	18 5 2.4	10.363	4	10 2 1.02	2.1715	8 2 26.7	14.287
5	8 17 59.86	2.9626	17 54 37.9	10.482	5	10 4 11.28	2.1708	7 48 7.9	14.337
6	8 20 15.55	2.9604	17 44 6.9	10.570	6	10 6 21.46	2.1682	7 33 46.2	14.386
7	8 22 31.11	2.9582	17 33 29.4	10.677	7	10 8 31.58	2.1661	7 19 21.6	14.434
8	8 24 46.53	2.9560	17 22 45.6	10.788	8	10 10 41.63	2.1670	7 4 54.1	14.481
9	8 27 1.82	2.9537	17 11 55.4	10.888	9	10 12 51.62	2.1680	6 50 23.9	14.526
10	8 29 16.97	2.9515	17 0 59.0	10.992	10	10 15 1.55	2.1661	6 35 51.0	14.569
11	8 31 31.99	2.9498	16 49 56.4	11.096	11	10 17 11.43	2.1643	6 21 15.6	14.611
12	8 33 46.88	2.9471	16 38 47.7	11.197	12	10 19 21.25	2.1633	6 6 37.7	14.652
13	8 36 1.63	2.9448	16 27 32.9	11.297	13	10 21 31.02	2.1626	5 51 57.4	14.691
14	8 38 16.25	2.9426	16 16 12.1	11.396	14	10 23 40.75	2.1617	5 37 14.8	14.729
15	8 40 30.74	2.9403	16 4 45.4	11.494	15	10 25 50.43	2.1610	5 22 30.0	14.768
16	8 42 45.09	2.9381	15 53 12.8	11.591	16	10 28 0.07	2.1603	5 7 43.1	14.800
17	8 44 59.31	2.9360	15 41 34.4	11.687	17	10 30 9.67	2.1607	4 52 54.1	14.833
18	8 47 13.40	2.9337	15 29 50.3	11.782	18	10 32 19.24	2.1609	4 38 3.2	14.865
19	8 49 27.36	2.9315	15 18 0.5	11.877	19	10 34 28.78	2.1607	4 23 10.4	14.896
20	8 51 41.18	2.9298	15 6 5.0	11.970	20	10 36 38.29	2.1603	4 8 15.8	14.925
21	8 53 54.87	2.9271	14 54 4.0	12.062	21	10 38 47.77	2.1679	3 53 19.4	14.953
22	8 56 8.43	2.9249	14 41 57.5	12.153	22	10 40 57.24	2.1676	3 38 21.4	14.979
23	8 58 21.86	2.9226	N. 14° 29' 45.7"	12.242	23	10 43 6.69	2.1674	N. 3° 23' 21.9"	15.008
TUESDAY 6.					THURSDAY 8.				
0	9 0 35.16	2.9208	N. 14° 17' 28.5"	12.330	0	10 45 16.13	2.1672	N. 3° 8' 21.0"	15.036
1	9 2 48.34	2.9185	14 5 6.0	12.417	1	10 47 25.56	2.1671	2 53 18.7	15.048
2	9 5 1.39	2.9164	13 52 38.4	12.503	2	10 49 34.98	2.1670	2 38 15.2	15.068
3	9 7 14.31	2.9143	13 40 5.7	12.587	3	10 51 44.40	2.1669	2 23 10.5	15.087
4	9 9 27.11	2.9122	13 27 27.9	12.670	4	10 53 53.81	2.1670	2 8 4.7	15.104
5	9 11 39.78	2.9102	13 14 45.1	12.753	5	10 56 3.23	2.1671	1 52 57.9	15.120
6	9 13 52.33	2.9082	13 1 57.5	12.834	6	10 58 12.66	2.1673	1 37 50.2	15.134
7	9 16 4.76	2.9062	12 49 5.0	12.914	7	11 0 22.10	2.1676	1 22 41.7	15.147
8	9 18 17.07	2.9042	12 36 7.8	12.992	8	11 2 31.56	2.1678	1 7 32.5	15.166
9	9 20 29.26	2.9022	12 23 5.9	13.069	9	11 4 41.04	2.1682	0 52 22.7	15.186
10	9 22 41.33	2.9003	12 9 59.5	13.145	10	11 6 50.54	2.1686	0 37 12.3	15.177
11	9 24 53.29	2.1984	11 56 48.5	13.220	11	11 9 0.06	2.1690	0 22 1.4	15.184
12	9 27 5.14	2.1968	11 43 33.1	13.293	12	11 11 9.62	2.1690	N. 0° 6' 50.2"	15.189
13	9 29 16.87	2.1947	11 30 13.3	13.365	13	11 13 19.21	2.1693	S. 0° 8' 21.3"	15.193
14	9 31 28.50	2.1929	11 16 49.3	13.436	14	11 15 28.84	2.1699	0 23 33.0	15.195
15	9 33 40.02	2.1912	11 3 21.0	13.506	15	11 17 38.51	2.1616	0 38 44.8	15.196
16	9 35 51.44	2.1894	10 49 48.6	13.574	16	11 19 48.23	2.1624	0 53 56.6	15.196
17	9 38 2.75	2.1877	10 36 12.1	13.641	17	11 21 58.00	2.1633	1 9 8.3	15.194
18	9 40 13.96	2.1860	10 22 31.7	13.708	18	11 24 7.82	2.1643	1 24 19.9	15.196
19	9 42 25.07	2.1844	10 8 47.4	13.770	19	11 26 17.69	2.1651	1 39 31.2	15.195
20	9 44 36.09	2.1828	9 54 59.3	13.833	20	11 28 27.63	2.1662	1 54 42.1	15.179
21	9 46 47.01	2.1812	9 41 7.4	13.896	21	11 30 37.63	2.1673	2 9 52.6	15.171
22	9 48 57.84	2.1797	9 27 11.9	13.956	22	11 32 47.70	2.1684	2 25 2.6	15.161
23	9 51 8.58	2.1782	9 13 12.8	14.014	23	11 34 57.84	2.1696	2 40 11.9	15.149
24	9 53 19.23	2.1768	N. 8° 59' 10.2"	14.071	24	11 37 8.05	2.1709	S. 2° 55' 20.5"	15.136

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	11 37 8.05	2.1700	S. 2 55 20.5	15.136	0	13 23 58.89	2.3018	S. 14 18 26.9	12.745
1	11 39 18.34	2.1723	3 10 28.3	15.123	1	13 26 17.12	2.3067	14 31 9.0	12.686
2	11 41 28.72	2.1737	3 25 35.2	15.106	2	13 26 35.58	2.3086	14 43 45.9	12.670
3	11 43 39.18	2.1762	3 40 41.1	15.089	3	13 30 54.27	2.3154	14 56 17.4	12.680
4	11 45 49.74	2.1767	3 55 45.9	15.070	4	13 33 13.20	2.3175	15 8 43.5	12.689
5	11 48 0.39	2.1763	4 10 49.5	15.050	5	13 35 32.37	2.3215	15 21 4.1	12.697
6	11 50 11.14	2.1800	4 25 51.9	15.029	6	13 37 51.78	2.3265	15 33 19.1	12.698
7	11 52 22.00	2.1818	4 40 53.0	15.006	7	13 40 11.43	2.3295	15 45 28.4	12.698
8	11 54 32.96	2.1836	4 55 52.6	14.981	8	13 42 31.32	2.3336	15 57 32.0	12.691
9	11 56 44.03	2.1864	5 10 50.7	14.964	9	13 44 51.46	2.3377	16 9 29.7	11.913
10	11 58 55.21	2.1874	5 25 47.1	14.936	10	13 47 11.84	2.3418	16 21 21.5	11.814
11	12 1 6.51	2.1894	5 40 41.8	14.897	11	13 49 32.47	2.3459	16 33 7.3	11.713
12	12 3 17.94	2.1916	5 55 34.8	14.866	12	13 51 53.35	2.3500	16 44 47.0	11.610
13	12 5 29.49	2.1936	6 10 25.9	14.834	13	13 54 14.47	2.3541	16 56 20.5	11.506
14	12 7 41.17	2.1958	6 25 14.9	14.800	14	13 56 35.84	2.3582	17 7 47.7	11.401
15	12 9 52.98	2.1980	6 40 1.8	14.764	15	13 58 57.46	2.3624	17 19 8.6	11.295
16	12 12 4.92	2.2003	6 54 46.6	14.727	16	14 1 19.33	2.3665	17 30 23.1	11.187
17	12 14 17.01	2.2027	7 9 29.1	14.688	17	14 3 41.45	2.3707	17 41 31.0	11.078
18	12 16 29.24	2.2051	7 24 9.2	14.648	18	14 6 3.82	2.3749	17 52 32.4	10.968
19	12 18 41.62	2.2075	7 38 46.9	14.607	19	14 8 26.44	2.3791	18 3 27.1	10.856
20	12 20 54.14	2.2100	7 53 22.1	14.564	20	14 10 49.31	2.3832	18 14 15.1	10.743
21	12 23 6.82	2.2126	8 7 54.7	14.520	21	14 13 12.43	2.3874	18 24 56.3	10.628
22	12 25 19.65	2.2153	8 22 24.5	14.474	22	14 15 35.80	2.3915	18 35 30.5	10.513
23	12 27 32.65	2.2180	S. 8 36 51.5	14.426	23	14 17 59.42	2.3957	S. 18 45 57.7	10.395
SATURDAY 10.					MONDAY 12.				
0	12 29 45.81	2.2206	S. 8 51 15.6	14.377	0	14 20 23.29	2.3998	S. 18 56 17.9	10.277
1	12 31 59.14	2.2236	9 5 36.7	14.336	1	14 22 47.41	2.4040	19 6 30.9	10.157
2	12 34 12.64	2.2264	9 19 54.7	14.294	2	14 25 11.77	2.4081	19 16 36.7	10.036
3	12 36 26.31	2.2293	9 34 9.5	14.250	3	14 27 36.38	2.4122	19 26 35.2	9.914
4	12 38 40.16	2.2322	9 48 21.1	14.165	4	14 30 1.23	2.4163	19 36 26.3	9.790
5	12 40 54.19	2.2353	10 2 29.3	14.108	5	14 32 26.33	2.4203	19 46 10.0	9.665
6	12 43 8.40	2.2384	10 16 34.1	14.040	6	14 34 51.67	2.4244	19 55 46.1	9.539
7	12 45 22.80	2.2416	10 30 35.3	13.990	7	14 37 17.25	2.4284	20 5 14.6	9.411
8	12 47 37.39	2.2448	10 44 32.9	13.929	8	14 39 43.08	2.4324	20 14 35.4	9.282
9	12 49 52.17	2.2480	10 58 26.8	13.865	9	14 42 9.15	2.4364	20 23 48.5	9.153
10	12 52 7.15	2.2513	11 12 16.8	13.802	10	14 44 35.45	2.4405	20 32 53.7	9.023
11	12 54 22.32	2.2546	11 26 2.9	13.736	11	14 47 1.98	2.4445	20 41 51.1	8.890
12	12 56 37.70	2.2580	11 39 45.1	13.669	12	14 49 28.75	2.4485	20 50 40.5	8.757
13	12 58 53.28	2.2614	11 53 23.2	13.600	13	14 51 55.75	2.4519	20 59 21.9	8.623
14	13 1 9.07	2.2649	12 6 57.1	13.530	14	14 54 22.97	2.4557	21 7 55.2	8.488
15	13 3 25.07	2.2684	12 20 26.7	13.458	15	14 56 50.42	2.4594	21 16 20.4	8.351
16	13 5 41.28	2.2720	12 33 52.0	13.385	16	14 59 18.10	2.4631	21 24 37.3	8.213
17	13 7 57.71	2.2756	12 47 12.8	13.310	17	15 1 46.00	2.4667	21 32 45.9	8.074
18	13 10 14.35	2.2792	13 0 29.1	13.234	18	15 4 14.11	2.4708	21 40 46.2	7.934
19	13 12 31.21	2.2828	13 13 40.8	13.156	19	15 6 42.43	2.4738	21 48 38.1	7.794
20	13 14 48.29	2.2865	13 26 47.8	13.077	20	15 9 10.97	2.4773	21 56 21.5	7.652
21	13 17 5.60	2.2903	13 39 50.0	12.996	21	15 11 39.71	2.4807	22 3 56.3	7.509
22	13 19 23.13	2.2941	13 52 47.3	12.914	22	15 14 8.66	2.4841	22 11 22.6	7.365
23	13 21 40.89	2.2980	14 5 39.6	12.830	23	15 16 37.81	2.4874	22 18 40.3	7.221
24	13 23 58.89	2.3018	S. 14 18 26.9	12.745	24	15 19 7.15	2.4907	S. 22 25 49.2	7.076

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
TUESDAY 13.					THURSDAY 15.				
0	15 19 7.15	2.4907	S. 22° 25' 49.2	7.076	0	17 20 45.78	2.5377	S. 25° 5' 23.8	0.592
1	15 21 36.69	2.4939	22 32 49.4	6.929	1	17 23 17.99	2.5390	25 4 45.8	0.713
2	15 24 6.42	2.4970	22 39 40.7	6.781	2	17 25 50.10	2.5343	25 3 58.2	0.874
3	15 26 36.33	2.5000	22 46 23.2	6.633	3	17 28 22.09	2.5323	25 3 0.9	1.085
4	15 29 6.42	2.5030	22 52 56.7	6.484	4	17 30 53.96	2.5301	25 1 54.0	1.196
5	15 31 36.69	2.5059	22 59 21.3	6.334	5	17 33 25.70	2.5279	25 0 37.5	1.356
6	15 34 7.13	2.5087	23 5 36.8	6.183	6	17 35 57.31	2.5256	24 59 11.5	1.514
7	15 36 37.74	2.5116	23 11 43.3	6.032	7	17 38 28.77	2.5232	24 57 36.0	1.672
8	15 39 8.51	2.5141	23 17 40.6	5.880	8	17 41 00.09	2.5207	24 55 50.9	1.830
9	15 41 39.44	2.5167	23 23 28.8	5.726	9	17 43 31.25	2.5180	24 53 56.4	1.988
10	15 44 10.52	2.5193	23 29 7.7	5.573	10	17 46 2.25	2.5153	24 51 52.4	2.145
11	15 46 41.74	2.5216	23 34 37.4	5.418	11	17 48 33.09	2.5125	24 49 39.0	2.301
12	15 49 13.11	2.5239	23 39 57.8	5.263	12	17 51 3.75	2.5096	24 47 16.3	2.457
13	15 51 44.61	2.5261	23 45 8.9	5.107	13	17 53 34.23	2.5066	24 44 44.2	2.613
14	15 54 16.25	2.5283	23 50 10.6	4.950	14	17 56 4.53	2.5033	24 42 2.9	2.768
15	15 56 48.01	2.5304	23 55 2.9	4.793	15	17 58 34.63	2.5001	24 39 12.4	2.919
16	15 59 19.90	2.5324	23 59 45.8	4.636	16	18 1 4.54	2.4968	24 36 12.6	3.072
17	16 1 51.90	2.5343	24 4 19.2	4.477	17	18 3 34.24	2.4933	24 33 3.7	3.225
18	16 4 24.01	2.5360	24 8 43.1	4.318	18	18 6 3.73	2.4897	24 29 45.6	3.377
19	16 6 56.22	2.5377	24 12 57.4	4.159	19	18 8 33.01	2.4861	24 26 18.5	3.527
20	16 9 28.53	2.5392	24 17 2.2	3.999	20	18 11 2.06	2.4824	24 22 42.4	3.677
21	16 12 0.93	2.5407	24 20 57.4	3.839	21	18 13 30.89	2.4786	24 18 57.3	3.826
22	16 14 33.41	2.5421	24 24 42.9	3.678	22	18 15 59.48	2.4746	24 15 3.3	3.974
23	16 17 5.97	2.5433	S. 24° 28' 18.8	3.517	23	18 18 27.84	2.4706	S. 24° 11' 0.4	4.122
WEDNESDAY 14.					FRIDAY 16.				
0	16 19 38.61	2.5444	S. 24° 31' 45.0	3.356	0	18 20 55.95	2.4696	S. 24° 6' 48.7	4.366
1	16 22 11.31	2.5465	24 35 1.5	3.194	1	18 23 23.82	2.4622	24 2 28.2	4.413
2	16 24 44.07	2.5484	24 38 8.3	3.032	2	18 25 51.43	2.4581	23 57 59.1	4.557
3	16 27 16.88	2.5472	24 41 5.4	2.870	3	18 28 18.79	2.4539	23 53 21.3	4.701
4	16 29 49.73	2.5478	24 43 52.7	2.708	4	18 30 45.89	2.4494	23 48 35.0	4.844
5	16 32 22.62	2.5484	24 46 30.3	2.545	5	18 33 12.72	2.4449	23 43 40.1	4.985
6	16 34 55.54	2.5489	24 48 58.1	2.382	6	18 35 39.28	2.4404	23 38 36.8	5.126
7	16 37 28.49	2.5493	24 51 16.1	2.219	7	18 38 5.57	2.4358	23 33 25.1	5.265
8	16 40 1.46	2.5496	24 53 24.4	2.056	8	18 40 31.58	2.4311	23 28 5.0	5.404
9	16 42 34.44	2.5497	24 55 22.9	1.893	9	18 42 57.31	2.4264	23 22 36.6	5.543
10	16 45 7.42	2.5497	24 57 11.5	1.730	10	18 45 22.75	2.4216	23 17 0.0	5.678
11	16 47 40.40	2.5497	24 58 50.3	1.566	11	18 47 47.90	2.4167	23 11 15.3	5.813
12	16 50 13.38	2.5496	25 0 19.4	1.403	12	18 50 12.75	2.4118	23 5 22.5	5.947
13	16 52 46.34	2.5491	25 1 38.7	1.239	13	18 52 37.31	2.4068	22 59 21.7	6.080
14	16 55 19.27	2.5486	25 2 48.1	1.076	14	18 55 1.56	2.4017	22 53 12.9	6.213
15	16 57 52.17	2.5481	25 3 47.7	0.912	15	18 57 25.51	2.3966	22 46 56.3	6.343
16	17 0 25.04	2.5474	25 4 37.5	0.749	16	18 59 49.15	2.3914	22 40 31.8	6.473
17	17 2 57.86	2.5466	25 5 17.5	0.586	17	19 2 12.48	2.3863	22 33 59.6	6.601
18	17 5 30.63	2.5457	25 5 47.7	0.423	18	19 4 35.49	2.3809	22 27 19.7	6.736
19	17 8 3.34	2.5447	25 6 8.1	0.260	19	19 6 58.18	2.3756	22 20 32.2	6.864
20	17 10 35.99	2.5435	25 6 18.7	0.095	20	19 9 20.56	2.3702	22 13 37.2	6.979
21	17 13 8.57	2.5422	25 6 19.6	0.007	21	19 11 42.61	2.3648	22 6 34.7	7.108
22	17 15 41.06	2.5408	25 6 10.7	0.239	22	19 14 4.34	2.3594	21 59 24.9	7.236
23	17 18 13.47	2.5393	25 5 52.1	0.391	23	19 16 25.74	2.3540	21 52 7.7	7.347
24	17 20 45.78	2.5377	S. 25° 5' 23.8	0.592	24	19 18 46.82	2.3486	S. 21° 44' 43.3	7.467

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	19 18 46.82	2.3485	S. 21° 44' 43.3	7.467	0	21 4 59.49	2.0613	S. 13° 52' 43.2	11.699
1	19 21 7.57	2.3480	21 37 11.7	7.465	1	21 7 4.22	2.0763	13 40 59.6	11.755
2	19 23 27.98	2.3374	21 29 33.1	7.703	2	21 9 8.65	2.0714	13 29 12.6	11.810
3	19 25 48.06	2.3318	21 21 47.4	7.819	3	21 11 12.79	2.0665	13 17 22.4	11.864
4	19 28 7.80	2.3262	21 13 54.8	7.934	4	21 13 16.63	2.0616	13 5 28.9	11.917
5	19 30 27.20	2.3206	21 5 55.3	8.047	5	21 15 20.18	2.0568	12 53 32.3	11.969
6	19 32 46.27	2.3149	20 57 49.1	8.159	6	21 17 23.44	2.0520	12 41 32.6	12.019
7	19 35 5.00	2.3092	20 49 36.2	8.270	7	21 19 26.42	2.0473	12 29 30.0	12.068
8	19 37 23.38	2.3035	20 41 16.7	8.380	8	21 21 29.11	2.0426	12 17 24.4	12.116
9	19 39 41.42	2.2978	20 32 50.6	8.489	9	21 23 31.52	2.0379	12 5 16.0	12.163
10	19 41 59.12	2.2921	20 24 18.0	8.596	10	21 25 33.66	2.0333	11 53 4.8	12.209
11	19 44 16.47	2.2863	20 15 39.1	8.702	11	21 27 35.52	2.0287	11 40 50.9	12.253
12	19 46 33.48	2.2806	20 6 53.8	8.807	12	21 29 37.11	2.0243	11 28 34.4	12.296
13	19 48 50.14	2.2748	19 58 2.3	8.910	13	21 31 38.43	2.0198	11 16 15.3	12.338
14	19 51 6.46	2.2691	19 49 4.6	9.012	14	21 33 39.49	2.0155	11 3 53.8	12.379
15	19 53 22.43	2.2633	19 40 0.8	9.113	15	21 35 40.29	2.0112	10 51 29.8	12.420
16	19 55 38.06	2.2576	19 30 51.0	9.212	16	21 37 40.83	2.0069	10 39 3.4	12.460
17	19 57 53.34	2.2518	19 21 35.4	9.310	17	21 39 41.12	2.0027	10 26 34.8	12.496
18	20 0 8.28	2.2460	19 12 13.9	9.407	18	21 41 41.15	1.9985	10 14 3.9	12.532
19	20 2 22.87	2.2402	19 2 46.6	9.503	19	21 43 40.94	1.9944	10 1 30.9	12.566
20	20 4 37.11	2.2344	18 53 13.6	9.596	20	21 45 40.48	1.9904	9 48 55.8	12.602
21	20 6 51.01	2.2287	18 43 35.0	9.689	21	21 47 39.78	1.9864	9 36 18.7	12.636
22	20 9 4.56	2.2230	18 33 50.8	9.781	22	21 49 38.85	1.9824	9 23 39.6	12.667
23	20 11 17.77	2.2172	S. 18° 24' 1.2	9.871	23	21 51 37.68	1.9785	S. 9° 10' 58.7	12.698
SUNDAY 18.					TUESDAY 20.				
0	20 13 30.63	2.2115	S. 18° 14' 6.3	9.960	0	21 53 36.27	1.9747	S. 8° 58' 15.9	12.728
1	20 15 43.15	2.2058	18 4 6.1	10.047	1	21 55 34.64	1.9709	8 45 31.4	12.756
2	20 17 55.33	2.2001	17 54 0.7	10.133	2	21 57 32.78	1.9671	8 32 45.2	12.784
3	20 20 7.17	2.1945	17 43 50.1	10.218	3	21 59 30.69	1.9634	8 19 57.3	12.811
4	20 22 18.67	2.1888	17 33 34.5	10.301	4	22 1 28.39	1.9598	8 7 7.9	12.837
5	20 24 29.83	2.1832	17 23 13.9	10.383	5	22 3 25.87	1.9562	7 54 17.0	12.861
6	20 26 40.65	2.1776	17 12 48.5	10.464	6	22 5 23.14	1.9527	7 41 24.6	12.884
7	20 28 51.14	2.1720	17 2 18.2	10.544	7	22 7 20.20	1.9492	7 28 30.9	12.906
8	20 31 1.29	2.1664	16 51 43.2	10.623	8	22 9 17.05	1.9456	7 15 35.9	12.927
9	20 33 11.11	2.1608	16 41 3.5	10.699	9	22 11 13.69	1.9424	7 2 39.6	12.948
10	20 35 20.59	2.1552	16 30 19.3	10.774	10	22 13 10.14	1.9392	6 49 42.2	12.967
11	20 37 29.74	2.1497	16 19 30.6	10.848	11	22 15 6.40	1.9360	6 36 43.6	12.985
12	20 39 38.56	2.1443	16 8 37.5	10.921	12	22 17 2.46	1.9329	6 23 44.0	13.002
13	20 41 47.06	2.1389	15 57 40.0	10.993	13	22 18 58.34	1.9298	6 10 43.4	13.018
14	20 43 55.23	2.1335	15 46 38.3	11.064	14	22 20 54.03	1.9268	5 57 41.8	13.033
15	20 46 3.08	2.1281	15 35 32.4	11.133	15	22 22 49.54	1.9238	5 44 39.3	13.046
16	20 48 10.60	2.1227	15 24 22.3	11.201	16	22 24 44.88	1.9209	5 31 36.0	13.059
17	20 50 17.80	2.1174	15 13 8.2	11.268	17	22 26 40.04	1.9180	5 18 32.0	13.073
18	20 52 24.69	2.1122	15 1 50.2	11.333	18	22 28 35.04	1.9152	5 5 27.2	13.084
19	20 54 31.27	2.1070	14 50 28.3	11.397	19	22 30 29.87	1.9125	4 52 21.8	13.096
20	20 56 37.53	2.1018	14 39 2.6	11.459	20	22 32 24.54	1.9098	4 39 15.8	13.106
21	20 58 43.48	2.0966	14 27 33.2	11.521	21	22 34 19.05	1.9073	4 26 9.2	13.113
22	21 0 49.12	2.0915	14 16 0.1	11.582	22	22 36 13.40	1.9047	4 13 2.2	13.120
23	21 2 54.46	2.0864	14 4 23.4	11.641	23	22 38 7.60	1.9022	3 59 54.8	13.127
24	21 4 59.49	2.0813	S. 13° 52' 43.2	11.699	24	22 40 1.66	1.8997	S. 3° 46' 47.0	13.133

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 21.					FRIDAY 23.				
0	^h 22 ^m 40 ^s 1.66	1.8997	S. 3° 46' 47.0"	13.133	0	^h 0 9 ^m 32.38	1.8627	N. 6° 33' 43.2"	12.415
1	22 41 55.57	1.8973	3 33 38.9	13.137	1	0 11 23.56	1.8632	6 46 7.1	12.381
2	22 43 49.34	1.8950	3 20 30.6	13.141	2	0 13 14.76	1.8637	6 58 28.9	12.346
3	22 45 42.97	1.8927	3 7 22.0	13.144	3	0 15 5.99	1.8642	7 10 48.6	12.311
4	22 47 36.46	1.8906	2 54 13.3	13.146	4	0 16 57.26	1.8646	7 23 6.2	12.275
5	22 49 29.82	1.8883	2 41 4.5	13.146	5	0 18 48.56	1.8654	7 35 21.7	12.239
6	22 51 23.06	1.8862	2 27 55.7	13.146	6	0 20 39.91	1.8661	7 47 34.9	12.202
7	22 53 16.17	1.8842	2 14 46.9	13.146	7	0 22 31.30	1.8669	7 59 45.9	12.164
8	22 55 9.17	1.8823	2 1 38.1	13.145	8	0 24 22.74	1.8677	8 11 54.6	12.126
9	22 57 2.05	1.8804	1 48 29.5	13.143	9	0 26 14.23	1.8686	8 24 0.9	12.086
10	22 58 54.82	1.8785	1 35 21.0	13.140	10	0 28 5.77	1.8696	8 36 4.9	12.046
11	23 0 47.48	1.8767	1 22 12.8	13.136	11	0 29 57.37	1.8696	8 48 6.5	12.006
12	23 2 40.03	1.8740	1 9 4.9	13.130	12	0 31 49.03	1.8616	9 0 5.6	11.966
13	23 4 32.48	1.8734	0 55 57.3	13.124	13	0 33 40.76	1.8627	9 12 2.2	11.922
14	23 6 24.84	1.8718	0 42 50.0	13.117	14	0 35 32.55	1.8636	9 23 56.2	11.879
15	23 8 17.10	1.8708	0 29 43.2	13.109	15	0 37 24.41	1.8650	9 35 47.7	11.836
16	23 10 9.27	1.8698	0 16 36.9	13.101	16	0 39 16.34	1.8662	9 47 36.5	11.792
17	23 12 1.36	1.8674	S. 0 3 31.1	13.093	17	0 41 8.35	1.8676	9 59 22.7	11.747
18	23 13 53.36	1.8660	N. 0 9 34.1	13.083	18	0 43 0.44	1.8689	10 11 6.1	11.701
19	23 15 45.28	1.8647	0 22 38.7	13.071	19	0 44 52.61	1.8708	10 22 46.8	11.656
20	23 17 37.13	1.8635	0 35 42.6	13.060	20	0 46 44.87	1.8717	10 34 24.7	11.608
21	23 19 28.90	1.8623	0 48 45.7	13.046	21	0 48 37.21	1.8732	10 45 59.8	11.560
22	23 21 20.61	1.8612	1 1 48.1	13.032	22	0 50 29.65	1.8747	10 57 32.0	11.512
23	23 23 12.25	1.8601	N. 1 14 49.6	13.018	23	0 52 22.18	1.8763	N. 11 9 1.3	11.463
THURSDAY 22.					SATURDAY 24.				
0	23 25 3.83	1.8591	N. 1 27 50.3	13.003	0	0 54 14.80	1.8779	N. 11 20 27.6	11.414
1	23 26 55.35	1.8569	1 40 50.0	12.987	1	0 56 7.52	1.8796	11 31 51.0	11.364
2	23 28 46.82	1.8573	1 53 48.8	12.970	2	0 58 0.35	1.8812	11 43 11.3	11.313
3	23 30 38.23	1.8565	2 6 46.5	12.953	3	0 59 53.29	1.8831	11 54 28.6	11.262
4	23 32 29.60	1.8557	2 19 43.2	12.935	4	1 1 46.33	1.8849	12 5 42.7	11.210
5	23 34 20.93	1.8550	2 32 38.8	12.917	5	1 3 39.48	1.8868	12 16 53.7	11.167
6	23 36 12.21	1.8544	2 45 33.2	12.898	6	1 5 32.75	1.8887	12 28 1.5	11.108
7	23 38 3.46	1.8538	2 58 26.4	12.877	7	1 7 26.14	1.8907	12 39 6.1	11.049
8	23 39 54.67	1.8533	3 11 18.4	12.856	8	1 9 19.64	1.8927	12 50 7.4	10.994
9	23 41 45.85	1.8528	3 24 9.1	12.834	9	1 11 13.27	1.8948	13 1 5.4	10.938
10	23 43 37.01	1.8524	3 36 58.5	12.811	10	1 13 7.02	1.8969	13 12 0.0	10.882
11	23 45 28.15	1.8521	3 49 46.5	12.787	11	1 15 0.90	1.8990	13 22 51.2	10.826
12	23 47 19.26	1.8518	4 2 33.0	12.763	12	1 16 54.90	1.9012	13 33 39.0	10.767
13	23 49 10.36	1.8516	4 15 18.1	12.738	13	1 18 49.04	1.9035	13 44 23.3	10.709
14	23 51 1.44	1.8514	4 28 1.6	12.712	14	1 20 43.32	1.9058	13 55 4.1	10.650
15	23 52 52.52	1.8513	4 40 43.6	12.686	15	1 22 37.73	1.9081	14 5 41.3	10.591
16	23 54 43.59	1.8512	4 53 23.9	12.660	16	1 24 32.29	1.9104	14 16 15.0	10.531
17	23 56 34.66	1.8512	5 6 2.5	12.630	17	1 26 26.99	1.9128	14 26 45.0	10.470
18	23 58 25.73	1.8512	5 18 39.5	12.602	18	1 28 21.83	1.9158	14 37 11.4	10.408
19	0 0 16.81	1.8513	5 31 14.7	12.573	19	1 30 16.82	1.9178	14 47 34.0	10.346
20	0 2 7.89	1.8515	5 43 48.2	12.543	20	1 32 11.97	1.9208	14 57 52.9	10.283
21	0 3 58.99	1.8517	5 56 19.8	12.511	21	1 34 7.27	1.9229	15 8 8.0	10.219
22	0 5 50.10	1.8520	6 8 49.5	12.480	22	1 36 2.72	1.9255	15 18 19.2	10.155
23	0 7 41.23	1.8523	6 21 17.3	12.448	23	1 37 58.33	1.9282	15 28 26.6	10.091
24	0 9 32.38	1.8527	N. 6 33 43.2	12.415	24	1 39 54.10	1.9309	N. 15 38 30.1	10.026

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	1 39 54.10	1.9309	N.15° 38' 30.1"	10.026	0	3 16 14.63	2.0912	N.22° 11' 22.9"	6.065
1	1 41 50.04	1.9336	15 48 29.6	9.999	1	3 18 20.22	2.0949	22 17 25.0	5.996
2	1 43 46.14	1.9364	15 58 25.2	9.992	2	3 20 26.02	2.0985	22 23 21.2	5.967
3	1 45 42.41	1.9392	16 8 16.7	9.994	3	3 22 32.04	2.1022	22 29 11.4	5.787
4	1 47 38.84	1.9420	16 18 4.1	9.768	4	3 24 38.28	2.1068	22 34 55.6	5.866
5	1 49 35.44	1.9449	16 27 47.4	9.697	5	3 26 44.74	2.1096	22 40 33.7	5.865
6	1 51 32.22	1.9478	16 37 26.6	9.617	6	3 28 51.42	2.1131	22 46 5.7	5.453
7	1 53 29.17	1.9507	16 47 1.6	9.547	7	3 30 58.31	2.1167	22 51 31.7	5.380
8	1 55 26.30	1.9537	16 56 32.3	9.476	8	3 33 5.42	2.1208	22 56 51.5	5.277
9	1 57 23.61	1.9567	17 5 58.8	9.405	9	3 35 12.75	2.1230	23 2 5.0	5.173
10	1 59 21.10	1.9597	17 15 20.9	9.333	10	3 37 20.29	2.1276	23 7 12.3	5.089
11	2 1 18.77	1.9628	17 24 38.7	9.260	11	3 39 28.05	2.1311	23 12 13.3	4.964
12	2 3 16.63	1.9659	17 33 52.1	9.186	12	3 41 36.02	2.1347	23 17 8.0	4.836
13	2 5 14.68	1.9690	17 43 1.0	9.112	13	3 43 44.21	2.1383	23 21 56.3	4.751
14	2 7 12.91	1.9721	17 52 5.5	9.037	14	3 45 52.61	2.1418	23 26 38.1	4.644
15	2 9 11.33	1.9753	18 1 5.5	8.962	15	3 48 1.22	2.1453	23 31 13.5	4.536
16	2 11 9.95	1.9785	18 10 0.9	8.886	16	3 50 10.04	2.1496	23 35 42.5	4.428
17	2 13 8.76	1.9817	18 18 51.7	8.808	17	3 52 19.08	2.1523	23 40 4.9	4.319
18	2 15 7.76	1.9850	18 27 37.9	8.730	18	3 54 28.32	2.1566	23 44 20.8	4.209
19	2 17 6.96	1.9883	18 36 19.4	8.652	19	3 56 37.77	2.1592	23 48 30.1	4.099
20	2 19 6.36	1.9916	18 44 56.1	8.573	20	3 58 47.42	2.1626	23 52 32.7	3.986
21	2 21 5.96	1.9950	18 53 28.0	8.493	21	4 0 57.28	2.1660	23 56 28.6	3.877
22	2 23 5.76	1.9984	19 1 55.2	8.413	22	4 3 7.34	2.1694	24 0 17.9	3.765
23	2 25 5.76	2.0018	N.19 10 17.5	8.332	23	4 5 17.60	2.1737	N.24 4 0.4	3.652
MONDAY 26.					WEDNESDAY 28.				
0	2 27 5.97	2.0052	N.19 18 35.0	8.250	0	4 7 28.07	2.1761	N.24 7 36.2	3.539
1	2 29 6.38	2.0086	19 26 47.5	8.168	1	4 9 38.74	2.1794	24 11 5.1	3.426
2	2 31 7.00	2.0120	19 34 55.1	8.085	2	4 11 49.60	2.1826	24 14 27.2	3.311
3	2 33 7.83	2.0155	19 42 57.7	8.001	3	4 14 0.65	2.1868	24 17 42.4	3.196
4	2 35 8.86	2.0190	19 50 55.2	7.916	4	4 16 11.90	2.1900	24 20 50.7	3.080
5	2 37 10.10	2.0225	19 58 47.6	7.831	5	4 18 23.34	2.1922	24 23 52.0	2.964
6	2 39 11.56	2.0260	20 6 34.9	7.745	6	4 20 34.97	2.1953	24 26 46.4	2.848
7	2 41 13.22	2.0295	20 14 17.1	7.659	7	4 22 46.78	2.1984	24 29 33.8	2.731
8	2 43 15.10	2.0331	20 21 54.0	7.573	8	4 24 58.78	2.2015	24 32 14.1	2.613
9	2 45 17.19	2.0367	20 29 25.7	7.484	9	4 27 10.96	2.2046	24 34 47.3	2.494
10	2 47 19.50	2.0402	20 36 52.1	7.395	10	4 29 23.33	2.2076	24 37 13.4	2.376
11	2 49 22.02	2.0438	20 44 13.1	7.306	11	4 31 35.87	2.2106	24 39 32.4	2.257
12	2 51 24.75	2.0474	20 51 28.8	7.216	12	4 33 48.59	2.2134	24 41 44.2	2.137
13	2 53 27.70	2.0510	20 58 39.1	7.126	13	4 36 1.48	2.2163	24 43 48.8	2.016
14	2 55 30.87	2.0546	21 5 43.9	7.035	14	4 38 14.55	2.2191	24 45 46.1	1.895
15	2 57 34.26	2.0583	21 12 43.2	6.943	15	4 40 27.78	2.2219	24 47 36.2	1.774
16	2 59 37.87	2.0619	21 19 37.0	6.850	16	4 42 41.18	2.2247	24 49 19.0	1.652
17	3 1 41.70	2.0656	21 26 25.2	6.757	17	4 44 54.74	2.2274	24 50 54.5	1.530
18	3 3 45.74	2.0692	21 33 7.8	6.663	18	4 47 8.46	2.2301	24 52 22.6	1.407
19	3 5 50.00	2.0729	21 39 44.7	6.568	19	4 49 22.34	2.2327	24 53 43.3	1.283
20	3 7 54.49	2.0765	21 46 15.9	6.473	20	4 51 36.38	2.2353	24 54 56.6	1.160
21	3 9 59.20	2.0802	21 52 41.3	6.376	21	4 53 50.57	2.2378	24 56 2.5	1.036
22	3 12 4.12	2.0839	21 59 1.0	6.280	22	4 56 4.91	2.2403	24 57 0.9	0.911
23	3 14 9.26	2.0876	22 5 14.9	6.183	23	4 58 19.40	2.2427	24 57 51.8	0.786
24	3 16 14.63	2.0912	N.22 11 22.9	6.085	24	5 0 34.03	2.2451	N.24 58 35.2	0.661

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					SATURDAY 31.				
0	5 0 34.03	2.2461	N.24 58 35.2	0.661	0	6 50 1.74	2.2943	N.23 0 39.6	5.617
1	5 2 48.81	2.2474	24 59 11.1	0.635	1	6 52 19.39	2.2939	22 54 58.6	5.748
2	5 5 3.72	2.2487	24 59 39.4	0.409	2	6 54 37.01	2.2935	22 49 9.8	5.878
3	5 7 18.76	2.2519	25 0 0.1	0.282	3	6 56 54.61	2.2931	22 43 13.2	6.008
4	5 9 33.94	2.2541	25 0 13.2	0.165	4	6 59 12.18	2.2926	22 37 8.8	6.138
5	5 11 49.25	2.2562	25 0 18.7	0.038	5	7 1 29.72	2.2921	22 30 56.6	6.268
6	5 14 4.68	2.2568	25 0 16.5	0.100	6	7 3 47.23	2.2916	22 24 36.6	6.397
7	5 16 20.23	2.2508	25 0 6.6	0.328	7	7 6 4.71	2.2910	22 18 8.9	6.526
8	5 18 35.91	2.2533	24 59 49.1	0.356	8	7 8 22.15	2.2905	22 11 33.5	6.655
9	5 20 51.70	2.2543	24 59 23.9	0.485	9	7 10 39.55	2.2900	22 4 50.4	6.783
10	5 23 7.61	2.2590	24 58 50.9	0.614	10	7 12 56.90	2.2899	21 57 59.6	6.911
11	5 25 23.62	2.2678	24 58 10.2	0.743	11	7 15 14.21	2.2881	21 51 1.1	7.038
12	5 27 39.74	2.2686	24 57 21.7	0.872	12	7 17 31.47	2.2873	21 43 55.0	7.166
13	5 29 55.97	2.2713	24 56 25.5	1.002	13	7 19 48.69	2.2860	21 36 41.3	7.292
14	5 32 12.29	2.2736	24 55 21.4	1.132	14	7 22 5.85	2.2856	21 29 20.0	7.418
15	5 34 28.71	2.2744	24 54 9.5	1.263	15	7 24 22.96	2.2847	21 21 51.2	7.544
16	5 36 45.22	2.2769	24 52 49.8	1.394	16	7 26 40.01	2.2838	21 14 14.8	7.669
17	5 39 1.82	2.2774	24 51 22.2	1.525	17	7 28 57.01	2.2836	21 6 30.9	7.794
18	5 41 18.51	2.2786	24 49 46.8	1.656	18	7 31 13.95	2.2818	20 58 39.5	7.918
19	5 43 35.28	2.2801	24 48 3.5	1.787	19	7 33 30.83	2.2807	20 50 40.7	8.042
20	5 45 52.12	2.2814	24 46 12.4	1.918	20	7 35 47.64	2.2796	20 42 34.4	8.166
21	5 48 9.04	2.2836	24 44 13.4	2.050	21	7 38 4.39	2.2785	20 34 20.8	8.288
22	5 50 26.04	2.2836	24 42 6.4	2.182	22	7 40 21.07	2.2774	20 25 59.8	8.410
23	5 52 43.10	2.2849	N.24 39 51.5	2.314	23	7 42 37.68	2.2763	N.20 17 31.5	8.532
FRIDAY 30.					SUNDAY, SEPTEMBER 1.				
0	5 55 0.23	2.2880	N.24 37 28.7	2.446	0	7 44 54.23	2.2751	N.20 8 55.9	8.653
1	5 57 17.42	2.2870	24 34 58.0	2.578	PHASES OF THE MOON. ● New Moon, . . . 6 0 54.5 ☾ First Quarter, . . . 12 19 15.8 ○ Full Moon, . . . 19 23 51.5 ☾ Last Quarter, . . . 28 1 23.2				
2	5 59 34.67	2.2879	24 32 19.3	2.710					
3	6 1 51.97	2.2887	24 29 32.7	2.843					
4	6 4 9.32	2.2896	24 26 38.2	2.974					
5	6 6 26.72	2.2908	24 23 35.7	3.107	☾ Perigee, 10 2.6 ☾ Apogee, 25 15.8				
6	6 8 44.16	2.2910	24 20 25.3	3.239					
7	6 11 1.64	2.2917	24 17 6.9	3.372					
8	6 13 19.16	2.2923	24 13 40.6	3.504					
9	6 15 36.71	2.2936	24 10 6.3	3.637					
10	6 17 54.29	2.2933	24 6 24.1	3.769					
11	6 20 11.90	2.2937	24 2 33.9	3.902					
12	6 22 29.53	2.2941	23 58 35.8	4.034					
13	6 24 47.18	2.2944	23 54 29.7	4.167					
14	6 27 4.85	2.2946	23 50 15.7	4.299					
15	6 29 22.53	2.2948	23 45 53.7	4.432					
16	6 31 40.22	2.2949	23 41 23.8	4.564					
17	6 33 57.92	2.2960	23 36 46.0	4.697					
18	6 36 15.62	2.2960	23 32 0.2	4.829					
19	6 38 33.32	2.2950	23 27 6.5	4.961					
20	6 40 51.02	2.2949	23 22 4.9	5.093					
21	6 43 8.71	2.2948	23 16 55.4	5.224					
22	6 45 26.40	2.2947	23 11 38.0	5.355					
23	6 47 44.08	2.2946	23 6 12.7	5.486					
24	6 50 1.74	2.2943	N.23 0 39.6	5.617					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut W.	97° 20' 48"	3361	98° 43' 49"	3353	100° 6' 59"	3346	101° 30' 17"	3339
	α Pegasi W.	76 49 30	3073	78 18 13	3060	79 47 12	3047	81 16 27	3034
	α Arietis W.	33 24 46	2980	34 55 24	2964	36 26 22	2949	37 57 39	2935
	SUN E.	60 32 22	3282	59 7 50	3270	57 43 4	3256	56 18 3	3246
2	Fomalhaut W.	108 28 37	3313	109 52 35	3306	111 16 37	3298	112 40 42	3294
	α Pegasi W.	88 46 43	2998	90 17 36	2985	91 48 45	2972	93 20 11	2958
	α Arietis W.	45 38 44	2980	47 11 54	2965	48 45 23	2950	50 19 12	2935
	Aldebaran W.	15 5 5	3592	16 23 48	3449	17 45 9	3335	19 8 40	3244
	SUN E.	49 9 13	3179	47 42 39	3165	46 15 48	3152	44 48 41	3138
3	α Pegasi W.	101 1 30	2986	102 34 35	2951	104 7 57	2939	105 41 34	2927
	α Arietis W.	58 13 11	2740	59 48 58	2725	61 25 5	2709	63 1 33	2694
	Aldebaran W.	26 28 27	2964	27 59 37	2917	29 31 34	2892	31 4 16	2880
	SUN E.	37 28 42	3065	35 59 49	3050	34 30 38	3035	33 1 9	3021
8	SUN W.	26 4 9	2586	27 43 23	2578	29 22 48	2571	31 2 23	2565
	Spica E.	40 20 37	2377	38 34 3	2373	36 47 23	2370	35 0 39	2367
	Antares E.	85 56 21	2262	84 9 26	2267	82 22 23	2253	80 35 14	2249
9	SUN W.	39 22 0	2545	41 2 11	2543	42 42 25	2540	44 22 42	2539
	Antares E.	71 38 13	2235	69 50 37	2233	68 2 59	2222	66 15 19	2221
	α Aquilæ E.	121 48 21	2991	120 17 57	2993	118 46 56	2985	117 15 22	2972
10	SUN W.	52 44 29	2637	54 24 51	2638	56 5 12	2639	57 45 31	2640
	Venus W.	28 47 51	2707	30 24 21	2700	32 1 1	2694	33 37 49	2689
	Antares E.	57 16 47	2231	55 29 6	2232	53 41 26	2223	51 53 48	2215
	α Aquilæ E.	109 30 59	2928	107 57 7	2916	106 23 0	2907	104 48 41	2798
11	SUN W.	66 6 29	2552	67 46 30	2555	69 26 27	2559	71 6 19	2561
	Venus W.	41 42 51	2692	43 19 55	2692	44 56 59	2693	46 34 2	2694
	Antares E.	42 56 26	2247	41 9 9	2251	39 21 57	2254	37 34 50	2256
	α Aquilæ E.	96 55 4	2779	95 20 9	2779	93 45 13	2780	92 10 19	2782
	Fomalhaut E.	121 58 57	2993	120 25 36	2992	118 51 50	2985	117 17 42	2981
12	SUN W.	79 24 21	2593	81 3 40	2598	82 42 52	2599	84 21 56	2599
	Venus W.	54 38 35	2696	56 15 18	2701	57 51 56	2705	59 28 29	2710
	Spica W.	17 19 3	2339	19 4 6	2333	20 49 18	2328	22 34 36	2327
	Antares E.	28 40 47	2261	26 54 19	2266	25 7 59	2291	23 21 47	2296
	α Aquilæ E.	84 16 59	2990	82 42 43	2918	81 8 38	2923	79 34 46	2930
	Fomalhaut E.	109 23 5	2754	107 47 37	2749	106 12 2	2745	104 36 22	2743
13	SUN W.	92 35 31	2626	94 13 51	2622	95 52 8	2623	97 30 7	2623
	Venus W.	67 29 42	2734	69 5 37	2729	70 41 25	2746	72 17 5	2750
	Spica W.	31 21 7	2335	33 6 16	2336	34 51 20	2342	36 36 18	2346
	α Aquilæ E.	71 49 31	2912	70 17 28	2921	68 45 48	2921	67 14 34	2973
	Fomalhaut E.	96 37 38	2744	95 1 57	2747	93 26 19	2761	91 50 47	2766
	α Pegasi E.	117 59 12	2493	116 17 49	2494	114 36 27	2494	112 55 5	2496
14	SUN W.	105 38 19	2676	107 15 31	2682	108 52 34	2689	110 29 27	2697
	Venus W.	80 13 30	2782	81 48 22	2786	83 23 6	2795	84 57 41	2801
	Spica W.	45 19 34	2371	47 3 51	2375	48 48 1	2382	50 32 2	2387
	α Aquilæ E.	59 46 4	3114	58 18 11	3148	56 51 0	3186	55 24 34	3226
	Fomalhaut E.	83 55 3	2792	82 20 25	2801	80 45 59	2812	79 11 47	2824
	α Pegasi E.	104 28 57	2509	102 47 56	2513	101 7 1	2517	99 26 12	2522

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Fomalhaut W.	102° 53' 43"	2322	104° 17' 17"	2327	105° 40' 57"	2321	107° 4' 44"	2316
	α Pegasi W.	82 45 58	2021	84 15 45	2008	85 45 48	2005	87 16 7	2001
	α Arctis W.	39 29 14	2920	41 1 8	2906	42 33 21	2900	44 5 53	2878
	SUN E.	54 52 48	2322	53 27 17	2220	52 1 31	2207	50 35 30	2193
2	Fomalhaut W.	114 4 49	2303	115 28 57	2302	116 53 6	2304	118 17 13	2307
	α Pegasi W.	94 51 54	2916	96 23 53	2902	97 56 9	2900	99 28 41	2876
	α Arctis W.	51 53 21	2900	53 27 49	2785	55 2 37	2770	56 37 44	2765
	Aldebaran W.	20 33 57	2162	22 0 50	2102	23 28 57	2047	24 58 12	2006
	SUN E.	43 21 17	2122	41 53 35	2108	40 25 35	2093	38 57 17	2079
3	α Pegasi W.	107 15 27	2615	108 49 36	2604	110 23 59	2792	111 58 37	2783
	α Arctis W.	64 38 21	2679	66 15 29	2664	67 52 57	2649	69 30 46	2633
	Aldebaran W.	32 37 39	2621	34 11 39	2783	35 46 16	2768	37 21 28	2743
	SUN E.	31 31 22	2607	30 1 18	2593	28 30 56	2579	27 0 17	2565
8	SUN W.	32 42 6	2260	34 21 56	2255	36 1 52	2251	37 41 54	2248
	Spica E.	33 13 51	2266	31 27 1	2265	29 40 10	2265	27 53 19	2266
	Antares E.	78 48 0	2245	77 0 40	2243	75 13 15	2239	73 25 46	2237
9	SUN W.	46 3 1	2238	47 43 22	2237	49 23 44	2236	51 4 7	2232
	Antares E.	64 27 37	2221	62 39 55	2220	60 52 12	2220	59 4 29	2221
	α Aquilæ E.	115 43 18	2691	114 10 47	2672	112 37 52	2656	111 4 35	2640
10	SUN W.	59 25 48	2542	61 6 3	2544	62 46 15	2545	64 26 24	2549
	Venus W.	35 14 43	2687	36 51 41	2684	38 28 43	2682	40 5 47	2682
	Antares E.	50 6 13	2237	48 18 41	2238	46 31 12	2242	44 43 47	2245
	α Aquilæ E.	103 14 11	2792	101 39 33	2787	100 4 48	2783	98 29 58	2780
11	SUN W.	72 46 7	2665	74 25 50	2669	76 5 27	2674	77 44 57	2679
	Venus W.	48 11 3	2687	49 48 1	2689	51 24 56	2692	53 1 47	2694
	Antares E.	35 47 49	2292	34 0 54	2296	32 14 5	2270	30 27 22	2276
	α Aquilæ E.	90 35 28	2785	89 0 41	2789	87 25 59	2795	85 51 25	2801
	Fomalhaut E.	115 43 16	2788	114 8 33	2778	112 33 36	2768	110 58 26	2760
12	SUN W.	86 0 53	2693	87 39 44	2698	89 18 27	2614	90 57 3	2620
	Venus W.	61 4 56	2714	62 41 17	2719	64 17 32	2724	65 53 40	2729
	Spica W.	24 19 56	2296	26 5 17	2297	27 50 37	2299	29 35 54	2292
	Antares E.	21 35 45	2204	19 49 52	2212	18 4 10	2220	16 18 40	2231
	α Aquilæ E.	78 1 9	2651	76 27 47	2664	74 54 42	2679	73 21 56	2693
	Fomalhaut E.	103 0 39	2741	101 24 54	2741	99 49 8	2741	98 13 22	2742
13	SUN W.	99 8 3	2680	100 45 50	2685	102 23 29	2683	104 0 59	2670
	Venus W.	73 52 38	2756	75 28 3	2763	77 3 20	2769	78 38 29	2775
	Spica W.	38 21 11	2280	40 5 57	2265	41 50 36	2256	43 35 9	2265
	α Aquilæ E.	65 43 48	2697	64 13 31	2623	62 43 47	2651	61 14 37	2681
	Fomalhaut E.	90 15 21	2792	88 40 3	2768	87 4 53	2775	85 29 53	2783
	α Pegasi E.	111 13 45	2497	109 32 28	2499	107 51 14	2502	106 10 3	2505
14	SUN W.	112 6 11	2704	113 42 46	2711	115 19 11	2719	116 55 26	2726
	Venus W.	86 32 7	2698	88 6 24	2615	89 40 32	2622	91 14 31	2630
	Spica W.	52 15 55	2298	53 59 40	2299	55 43 16	2405	57 26 43	2411
	α Aquilæ E.	53 58 58	2272	52 34 14	2321	51 10 27	2375	49 47 42	2423
	Fomalhaut E.	77 37 50	2626	76 4 9	2649	74 30 45	2693	72 57 39	2678
	α Pegasi E.	97 45 29	2627	96 4 54	2533	94 24 27	2539	92 44 8	2545

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
15	SUN W.	118° 31' 31"	2724	120° 7' 26"	2741	121° 43' 11"	2749	123° 18' 46"	2756
	Venus W.	92 48 20	2637	94 22 0	2645	95 55 30	2652	97 28 50	2660
	Spica W.	59 10 2	2417	60 53 12	2424	62 36 12	2431	64 19 3	2438
	α Aquilæ E.	48 26 3	2497	47 5 36	2488	45 46 27	2464	44 28 40	2478
	Fomalhaut E.	71 24 52	2694	69 52 26	2612	68 20 23	2631	66 48 44	2642
	α Pegasi E.	91 3 57	2661	89 23 55	2659	87 44 3	2655	86 4 20	2673
	α Arietis E.	134 12 10	2443	132 29 37	2448	130 47 11	2453	129 4 52	2456
16	Venus W.	105 12 57	2601	106 45 15	2609	108 17 22	2618	109 49 18	2627
	Spica W.	72 50 53	2472	74 32 45	2480	76 14 27	2487	77 55 59	2494
	Antares W.	27 10 23	2473	28 52 14	2480	30 33 56	2486	32 15 29	2493
	Fomalhaut E.	59 17 26	2678	57 48 46	2106	56 20 43	2139	54 53 21	2175
	α Pegasi E.	77 48 32	2616	76 9 58	2626	74 31 37	2635	72 53 30	2646
	α Arietis E.	120 35 18	2489	118 53 49	2496	117 12 30	2502	115 31 20	2510
17	Venus W.	117 26 6	2973	118 56 52	2984	120 27 25	2993	121 57 46	3004
	Spica W.	86 20 58	2633	88 1 25	2643	89 41 40	2650	91 21 44	2656
	Antares W.	40 40 40	2831	42 21 10	2838	44 1 30	2847	45 41 38	2855
	Fomalhaut E.	47 48 21	2406	46 26 10	2403	45 5 3	2525	43 45 6	2566
	α Pegasi E.	64 46 37	2706	63 10 4	2719	61 33 49	2732	59 57 52	2747
	α Arietis E.	107 8 1	2546	105 27 52	2554	103 47 54	2562	102 8 7	2571
18	Spica W.	99 39 11	2601	101 18 4	2610	102 56 45	2620	104 35 13	2629
	Antares W.	53 59 27	2598	55 38 25	2606	57 17 12	2615	58 55 46	2624
	Fomalhaut E.	37 27 3	4079	36 16 41	4211	35 8 25	4361	34 2 28	4530
	α Pegasi E.	52 3 23	2636	50 29 40	2646	48 56 23	2677	47 23 35	2691
	α Arietis E.	93 52 5	2613	92 13 28	2623	90 35 3	2631	88 56 50	2640
	Aldebaran E.	126 19 40	2667	124 42 16	2673	123 5 0	2679	121 27 52	2686
19	Spica W.	112 44 25	2676	114 21 37	2687	115 58 35	2696	117 35 20	2706
	Antares W.	67 5 31	2671	68 42 50	2681	70 19 56	2691	71 56 48	2700
	α Pegasi E.	39 47 49	3046	38 18 36	3067	36 50 10	3129	35 22 35	3174
	α Arietis E.	80 48 55	2698	79 11 59	2698	77 35 16	2707	75 58 46	2717
	Aldebaran E.	113 24 37	2735	111 48 30	2733	110 12 34	2741	108 36 49	2750
20	Antares W.	79 57 56	2780	81 33 30	2790	83 8 51	2799	84 43 59	2780
	α Aquilæ W.	36 41 19	4689	37 42 28	4690	38 45 27	4448	39 50 5	4347
	α Arietis E.	67 59 39	2769	66 24 31	2780	64 49 37	2790	63 14 56	2801
	Aldebaran E.	100 41 1	2796	99 6 28	2806	97 32 8	2816	95 58 0	2825
21	Antares W.	92 36 18	2830	94 10 7	2840	95 43 43	2850	97 17 6	2860
	α Aquilæ W.	45 33 13	3093	46 44 59	3043	47 57 35	3001	49 10 54	3051
	α Arietis E.	55 25 5	2656	53 51 49	2667	52 18 48	2678	50 46 1	2686
	Aldebaran E.	88 10 34	2875	86 37 43	2886	85 5 6	2896	83 32 41	2906
	Pollux E.	130 3 22	2990	128 30 50	2997	126 58 27	2996	125 26 14	2912
22	Antares W.	105 0 54	2908	106 33 3	2917	108 5 0	2927	109 36 45	2936
	α Aquilæ W.	55 26 9	3723	56 42 32	3704	57 50 15	3696	59 16 17	3671
	Fomalhaut W.	32 53 30	4834	33 52 38	4691	34 53 45	4596	35 56 39	4486
	α Arietis E.	43 5 44	2946	41 34 24	2956	40 3 19	2970	38 32 29	2982
	Aldebaran E.	75 53 50	2966	74 22 42	2966	72 51 47	2976	71 21 4	2985
	Pollux E.	117 47 39	2992	116 16 26	2990	114 45 23	2990	113 14 31	2977
23	Antares W.	117 12 46	2977	118 43 27	2986	120 13 58	2996	121 44 20	3001
	α Aquilæ W.	65 44 51	3620	67 3 4	3613	68 21 24	3607	69 39 51	3602

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	SUN W.	124° 54' 11"	3768	126° 29' 25"	3773	128° 4' 28"	3782	129° 39' 20"	3786
	Venus W.	99 2 0	3808	100 35 0	3876	102 7 49	3884	103 40 28	3892
	Spica W.	66 1 44	2444	67 44 16	2451	69 26 38	2458	71 8 51	2465
	α Aquilæ E.	43 12 23	3929	41 57 44	3936	40 44 51	4043	39 33 54	4172
	Fomalhaut E.	65 17 31	3973	63 46 45	3996	62 16 27	3991	60 46 40	3947
	α Pegasi E.	84 24 48	3581	82 45 27	3589	81 6 17	3597	79 27 18	3607
	α Arctis E.	127 22 40	3466	125 40 37	3470	123 58 42	3477	122 16 56	3482
16	Venus W.	111 21 3	3986	112 52 36	3945	114 23 58	3954	115 55 8	3964
	Spica W.	79 37 20	3903	81 18 31	3910	82 59 31	3917	84 40 20	3926
	Antares W.	33 56 52	3600	35 38 5	3598	37 19 7	3515	38 59 59	3523
	Fomalhaut E.	53 26 42	3213	52 0 48	3255	50 35 44	3301	49 11 34	3351
	α Pegasi E.	71 15 37	3656	69 37 58	3688	68 0 35	3680	66 23 28	3692
	α Arctis E.	113 50 20	3517	112 9 30	3524	110 28 50	3531	108 48 20	3539
17	Venus W.	123 27 54	3014	124 57 49	3035	126 27 31	3036	127 56 59	3047
	Spica W.	93 1 37	2506	94 41 18	2576	96 20 47	2583	98 0 5	2592
	Antares W.	47 21 35	2564	49 1 20	2572	50 40 54	2580	52 20 16	2588
	Fomalhaut E.	42 26 26	3674	41 9 11	3760	39 53 27	3855	38 39 21	3951
	α Pegasi E.	58 23 15	3763	56 46 58	3779	55 12 3	3797	53 37 31	3815
	α Arctis E.	100 28 32	3579	98 49 8	3587	97 9 55	3596	95 30 54	3604
18	Spica W.	106 13 29	2638	107 51 32	2648	109 29 22	2657	111 7 0	2666
	Antares W.	60 34 8	2633	62 12 18	2643	63 50 15	2652	65 27 59	2661
	Fomalhaut E.	32 59 2	4721	31 58 20	4838	31 0 36	5198	30 6 6	5478
	α Pegasi E.	45 51 17	3926	44 19 31	3953	42 48 19	3992	41 17 44	3914
	α Arctis E.	87 18 49	3549	85 41 1	3569	84 3 26	3599	82 26 4	3678
	Aldebaran E.	119 50 53	2692	118 14 3	2701	116 37 24	2708	115 0 55	2716
19	Spica W.	119 11 52	2716	120 48 11	2736	122 24 16	2737	124 0 7	2747
	Antares W.	73 33 28	2710	75 9 55	2719	76 46 9	2730	78 22 9	2740
	α Pegasi E.	33 55 55	3236	32 30 17	3284	31 5 47	3348	29 42 31	3423
	α Arctis E.	74 22 29	2738	72 46 26	2738	71 10 37	2748	69 35 1	2759
	Aldebaran E.	107 1 15	2760	105 25 54	2768	103 50 44	2777	102 15 46	2787
20	Antares W.	86 18 53	2790	87 53 34	2800	89 28 2	2810	91 2 16	2820
	α Aquilæ W.	40 56 14	4299	42 3 45	4180	43 12 30	4111	44 22 21	4048
	α Arctis E.	61 40 29	2812	60 6 17	2828	58 32 19	2834	56 58 35	2845
	Aldebaran E.	94 24 5	2835	92 50 23	2845	91 16 54	2855	89 43 37	2866
21	Antares W.	98 50 16	2909	100 23 14	2979	101 56 0	2959	103 28 33	2968
	α Aquilæ W.	50 24 53	3827	51 39 27	3795	52 54 34	3768	54 10 9	3745
	α Arctis E.	49 13 29	2901	47 41 11	2913	46 9 8	2924	44 37 19	2935
	Aldebaran E.	82 0 29	3916	80 28 30	3926	78 56 44	3936	77 25 11	3946
	Pollux E.	123 54 11	3920	122 22 18	3928	120 50 35	3936	119 19 2	3944
22	Antares W.	111 8 19	3944	112 39 42	3953	114 10 54	3962	115 41 55	3969
	α Aquilæ W.	60 33 35	3698	61 51 7	3647	63 8 51	3686	64 26 46	3627
	Fomalhaut W.	37 1 10	4866	38 7 9	4374	39 14 26	4198	40 22 54	4186
	α Arctis E.	37 1 54	2994	35 31 34	3007	34 1 30	3021	32 31 43	3034
	Aldebaran E.	69 50 33	2995	68 20 14	3005	66 50 8	3015	65 20 14	3024
	Pollux E.	111 43 49	3984	110 13 16	3992	108 42 53	3990	107 12 40	3997
23	Antares W.	123 14 32	3907	124 44 36	3914	126 14 31	3921	127 44 18	3926
	α Aquilæ W.	70 58 23	3598	72 16 59	3595	73 35 39	3593	74 54 21	3591

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
23	Fomalhaut W.	41° 32' 27"	4071	42° 42' 57"	4017	43° 54' 20"	3909	45° 6' 30"	3935
	α Arietis E.	31 2 13	3048	29 33 0	3054	28 4 6	3079	26 35 31	3006
	Aldebaran E.	63 50 31	3034	62 21 0	3043	60 51 41	3062	59 22 33	3061
	Pollux E.	105 42 36	3015	104 12 42	3023	102 42 57	3029	101 13 20	3035
24	α Aquilæ W.	76 13 5	3689	77 31 51	3688	78 50 38	3685	80 9 25	3688
	Fomalhaut W.	51 16 55	3768	52 32 31	3744	53 48 32	3722	55 4 56	3703
	α Pegasi W.	28 30 8	3709	29 46 45	3665	31 4 20	3610	32 22 44	3569
	Aldebaran E.	51 59 40	3106	50 31 38	3116	49 3 48	3124	47 36 8	3133
	Pollux E.	93 47 16	3067	92 18 26	3072	90 49 42	3078	89 21 5	3062
	SUN E.	134 8 39	3414	132 46 38	3419	131 24 43	3423	130 2 53	3426
25	α Aquilæ W.	86 43 16	3592	88 1 59	3594	89 20 40	3596	90 39 19	3598
	Fomalhaut W.	61 31 31	3637	62 49 36	3615	64 7 54	3603	65 26 25	3603
	α Pegasi W.	39 4 4	3432	40 25 44	3413	41 47 46	3395	43 10 8	3379
	Aldebaran E.	40 20 33	3180	38 54 0	3191	37 27 40	3201	36 1 32	3213
	Pollux E.	81 59 23	3102	80 31 16	3105	79 3 13	3109	77 35 14	3110
	SUN E.	123 14 58	3447	121 53 35	3450	120 32 15	3452	119 10 57	3454
26	α Aquilæ W.	97 11 54	3612	98 30 15	3615	99 48 33	3619	101 6 47	3622
	Fomalhaut W.	72 1 40	3547	73 21 12	3540	74 40 52	3532	76 0 41	3526
	α Pegasi W.	50 5 57	3318	51 29 48	3305	52 53 52	3297	54 18 7	3287
	Aldebaran E.	28 54 43	3289	27 30 19	3311	26 6 20	3326	24 42 50	3306
	Pollux E.	70 15 48	3117	68 47 59	3117	67 20 10	3116	65 52 20	3115
	SUN E.	112 24 50	3456	111 3 37	3455	109 42 23	3454	108 21 8	3452
27	α Aquilæ W.	107 36 47	3648	108 54 30	3653	110 12 7	3660	111 29 37	3667
	Fomalhaut W.	82 41 46	3489	84 2 22	3482	85 23 6	3475	86 43 58	3469
	α Pegasi W.	61 22 12	3240	62 47 34	3231	64 13 7	3231	65 38 51	3231
	Pollux E.	58 32 52	3107	57 4 51	3103	55 36 47	3101	54 8 39	3098
	SUN E.	101 34 8	3436	100 12 32	3431	98 50 50	3425	97 29 2	3419
28	Fomalhaut W.	93 30 7	3436	94 51 43	3430	96 13 26	3424	97 35 15	3418
	α Pegasi W.	72 50 25	3183	74 17 20	3182	75 44 27	3141	77 11 47	3129
	α Arietis W.	29 19 56	3061	30 48 29	3066	32 17 20	3052	33 46 29	3036
	Pollux E.	46 46 56	3078	45 18 20	3074	43 49 39	3069	42 20 52	3035
	SUN E.	90 38 11	3382	89 15 34	3373	87 52 47	3355	86 29 50	3355
29	Fomalhaut W.	104 26 3	3300	105 48 31	3285	107 11 5	3281	108 33 43	3277
	α Pegasi W.	84 31 54	3072	86 0 38	3060	87 29 37	3047	88 58 52	3034
	α Arietis W.	41 16 28	2969	42 47 19	2955	44 18 28	2941	45 49 55	2927
	Pollux E.	34 55 43	3047	33 26 29	3045	31 57 13	3045	30 27 57	3047
	SUN E.	79 32 4	3298	78 7 50	3286	76 43 22	3273	75 18 39	3260
30	Fomalhaut W.	115 27 47	3267	116 50 41	3268	118 13 34	3270	119 36 25	3273
	α Pegasi W.	96 29 6	2969	97 59 58	2955	99 31 7	2941	101 2 34	2926
	α Arietis W.	53 31 49	2853	55 5 10	2835	56 38 52	2820	58 12 54	2804
	Aldebaran W.	22 0 18	3154	23 27 22	3099	24 55 33	3052	26 24 41	3008
	SUN E.	68 11 1	3188	66 44 37	3173	65 17 54	3157	63 50 53	3140
31	α Pegasi W.	108 44 4	2980	110 17 14	2948	111 50 40	2935	113 24 23	2922
	α Arietis W.	66 8 25	2721	67 44 37	2704	69 21 12	2687	70 58 10	2669
	Aldebaran W.	34 2 13	2844	35 35 44	2817	37 9 50	2790	38 44 31	2764
	SUN E.	56 30 49	3057	55 1 47	3039	53 32 23	3023	52 2 38	3005

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXTh.	P. L. of Dif.
23	Fomalhaut W.	46° 19' 24"	3687	47° 32' 57"	3683	48° 47' 6"	3621	50° 1' 46"	3793
	α Arietis E.	25 7 16	3116	23 39 25	3125	22 11 58	3153	20 44 59	3185
	Aldebaran E.	57 53 36	3070	56 24 50	3080	54 56 16	3088	53 27 52	3098
	Pollux E.	99 43 51	3043	98 14 31	3049	96 45 19	3055	95 16 14	3060
24	α Aquilæ W.	81 28 12	3686	82 46 59	3686	84 5 46	3689	85 24 32	3691
	Fomalhaut W.	56 21 40	3686	57 38 43	3686	58 56 4	3654	60 13 40	3640
	α Pegasi W.	33 41 52	3635	35 1 38	3604	36 21 58	3477	37 42 48	3454
	Aldebaran E.	46 8 39	3143	44 41 21	3162	43 14 14	3161	41 47 18	3170
	Pollux E.	87 52 34	3087	86 24 9	3091	84 55 49	3096	83 27 34	3099
	SUN E.	128 41 9	3433	127 19 30	3437	125 57 55	3440	124 36 24	3445
25	α Aquilæ W.	91 57 55	3600	93 16 29	3603	94 35 0	3606	95 53 29	3609
	Fomalhaut W.	66 45 7	3683	68 4 0	3673	69 23 4	3655	70 42 17	3655
	α Pegasi W.	44 32 47	3665	45 55 43	3631	47 18 54	3640	48 42 19	3629
	Aldebaran E.	34 35 38	3226	33 9 59	3239	31 44 36	3263	30 19 30	3270
	Pollux E.	76 7 17	3113	74 39 22	3114	73 11 29	3115	71 43 38	3116
	SUN E.	117 49 42	3455	116 28 28	3456	115 7 15	3456	113 46 2	3467
26	α Aquilæ W.	102 24 57	3627	103 43 2	3631	105 1 3	3636	106 18 58	3643
	Fomalhaut W.	77 20 38	3617	78 40 43	3610	80 0 56	3603	81 21 17	3596
	α Pegasi W.	55 42 34	3377	57 7 12	3368	58 32 1	3259	59 57 1	3249
	Aldebaran E.	23 19 55	3401	21 57 40	3444	20 36 13	3497	19 15 46	3563
	Pollux E.	64 24 29	3114	62 56 37	3114	61 28 44	3113	60 0 49	3110
	SUN E.	106 59 50	3450	105 38 30	3447	104 17 7	3444	102 55 40	3439
27	α Aquilæ W.	112 46 59	3676	114 4 12	3664	115 21 16	3664	116 38 9	3706
	Fomalhaut W.	88 4 57	3493	89 26 4	3455	90 47 18	3449	92 8 39	3443
	α Pegasi W.	67 4 47	3303	68 30 54	3193	69 57 13	3183	71 23 43	3173
	Pollux E.	52 40 27	3095	51 12 11	3091	49 43 51	3087	48 15 26	3083
	SUN E.	96 7 7	3413	94 45 5	3407	93 22 56	3399	92 0 38	3391
28	Fomalhaut W.	98 57 11	3411	100 19 15	3406	101 41 25	3400	103 3 41	3396
	α Pegasi W.	78 39 21	3119	80 7 8	3107	81 35 9	3096	83 3 24	3088
	α Arietis W.	35 15 55	3034	36 45 38	3010	38 15 38	2997	39 45 54	2988
	Pollux E.	40 52 0	3061	39 23 3	3057	37 54 1	3053	36 24 54	3040
	SUN E.	85 6 42	3345	83 43 22	3333	82 19 49	3322	80 56 3	3311
29	Fomalhaut W.	109 56 26	3373	111 19 13	3373	112 42 2	3369	114 4 54	3368
	α Pegasi W.	90 28 23	3022	91 58 9	3008	93 28 12	2995	94 58 31	2982
	α Arietis W.	47 21 40	2912	48 53 44	2898	50 26 6	2882	51 58 48	2867
	Pollux E.	28 58 42	3049	27 29 30	3054	26 0 24	3054	24 31 30	3077
	SUN E.	73 53 41	3346	72 28 26	3332	71 2 55	3318	69 37 7	3303
30	Fomalhaut W.	120 59 12	3379	122 21 54	3384	123 44 29	3393	125 6 54	3403
	α Pegasi W.	102 34 17	2914	104 6 18	2901	105 38 36	2887	107 11 11	2873
	α Arietis W.	59 47 17	2786	61 22 1	2771	62 57 7	2754	64 32 35	2738
	Aldebaran W.	27 54 42	2970	29 25 32	2935	30 57 6	2904	32 29 20	2873
	SUN E.	62 23 32	3124	60 55 52	3107	59 27 51	3091	57 59 30	3074
31	α Pegasi W.	114 58 22	2810	116 32 37	2798	118 7 8	2798	119 41 54	2775
	α Arietis W.	72 35 31	2653	74 13 16	2635	75 51 24	2618	77 29 55	2600
	Aldebaran W.	40 19 46	2740	41 55 33	2716	43 31 52	2693	45 8 41	2670
	SUN E.	50 32 32	2999	49 2 5	2973	47 31 17	2953	46 0 5	2935

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
		^h ^m ^s	^s	[°] ['] ["]	["]	['] ["]	^s			
Sun.	1	10 42 19.77	9.075	N. 8 12 32.3	54.58	15 53.82	64.41	0 12.06	0.781	
Mon.	2	10 45 57.40	9.064	7 50 38.7	54.91	15 54.05	64.37	0 30.93	0.792	
Tues.	3	10 49 34.76	9.053	7 28 37.4	55.22	15 54.29	64.33	0 50.08	0.803	
Wed.	4	10 53 11.87	9.043	7 6 28.8	55.52	15 54.53	64.29	1 9.47	0.814	
Thur.	5	10 56 48.74	9.034	6 44 13.3	55.80	15 54.77	64.25	1 29.11	0.824	
Fri.	6	11 0 25.38	9.025	6 21 51.1	56.07	15 55.01	64.22	1 48.96	0.833	
Sat.	7	11 4 1.81	9.016	5 59 22.7	56.32	15 55.26	64.19	2 9.02	0.841	
Sun.	8	11 7 38.04	9.008	5 36 48.4	56.56	15 55.51	64.17	2 29.30	0.848	
Mon.	9	11 11 14.08	9.001	5 14 8.5	56.78	15 55.76	64.15	2 49.76	0.855	
Tues.	10	11 14 49.97	8.994	4 51 23.4	56.99	15 56.02	64.13	3 10.36	0.862	
Wed.	11	11 18 25.72	8.989	4 28 33.5	57.19	15 56.28	64.11	3 31.11	0.868	
Thur.	12	11 22 1.33	8.984	4 5 39.0	57.38	15 56.54	64.09	3 51.98	0.872	
Fri.	13	11 25 36.84	8.980	3 42 40.2	57.54	15 56.80	64.08	4 12.97	0.875	
Sat.	14	11 29 12.27	8.977	3 19 37.5	57.70	15 57.06	64.07	4 34.04	0.878	
Sun.	15	11 32 47.63	8.974	2 56 31.3	57.84	15 57.33	64.06	4 55.19	0.880	
Mon.	16	11 36 22.95	8.973	2 33 21.9	57.97	15 57.60	64.06	5 16.36	0.882	
Tues.	17	11 39 58.24	8.972	2 10 9.5	58.09	15 57.87	64.06	5 37.55	0.884	
Wed.	18	11 43 33.53	8.973	1 46 54.4	58.19	15 58.13	64.06	5 58.77	0.882	
Thur.	19	11 47 8.84	8.974	1 23 37.0	58.29	15 58.39	64.07	6 19.96	0.880	
Fri.	20	11 50 44.20	8.977	1 0 17.5	58.36	15 58.66	64.08	6 41.09	0.878	
Sat.	21	11 54 19.62	8.980	0 36 56.2	58.43	15 58.93	64.09	7 2.16	0.875	
Sun.	22	11 57 55.14	8.984	N. 0 13 33.4	58.48	15 59.20	64.11	7 23.12	0.871	
Mon.	23	12 1 30.78	8.990	S. 0 9 50.3	58.52	15 59.46	64.13	7 43.96	0.866	
Tues.	24	12 5 6.58	8.997	0 33 14.8	58.55	15 59.73	64.15	8 4.65	0.860	
Wed.	25	12 8 42.54	9.004	0 56 39.8	58.56	16 0.00	64.17	8 25.20	0.853	
Thur.	26	12 12 18.69	9.013	1 20 4.8	58.55	16 0.27	64.20	8 45.55	0.844	
Fri.	27	12 15 55.05	9.022	1 43 29.6	58.53	16 0.54	64.23	9 5.69	0.834	
Sat.	28	12 19 31.64	9.032	2 6 53.8	58.49	16 0.81	64.26	9 25.60	0.825	
Sun.	29	12 23 8.48	9.042	2 30 16.9	58.44	16 1.08	64.30	9 45.26	0.815	
Mon.	30	12 26 45.60	9.054	2 53 38.6	58.38	16 1.35	64.34	10 4.64	0.804	
Tues.	31	12 30 23.00	9.066	S. 3 16 58.6	58.31	16 1.62	64.38	10 23.74	0.791	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		^h ^m ^s	^s	N. [°] ['] ["]	["]	^m ^s	^s	^h ^m ^s
Sun.	1	10 42 19.80	9.075	N. 8 12 32.1	54.58	0 12.06	0.781	10 42 31.86
Mon.	2	10 45 57.48	9.064	7 50 38.2	54.91	0 30.94	0.792	10 46 28.42
Tues.	3	10 49 34.88	9.053	7 28 36.6	55.22	0 50.09	0.803	10 50 24.97
Wed.	4	10 53 12.04	9.043	7 6 27.7	55.52	1 9.48	0.814	10 54 21.52
Thur.	5	10 56 48.96	9.034	6 44 11.9	55.80	1 29.12	0.824	10 58 18.08
Fri.	6	11 0 25.65	9.025	6 21 49.4	56.07	1 48.98	0.833	11 2 14.63
Sat.	7	11 4 2.13	9.016	5 59 20.7	56.32	2 9.05	0.841	11 6 11.18
Sun.	8	11 7 38.41	9.008	5 36 46.1	56.56	2 29.33	0.848	11 10 7.74
Mon.	9	11 11 14.50	9.001	5 14 5.9	56.78	2 49.79	0.855	11 14 4.29
Tues.	10	11 14 50.44	8.994	4 51 20.5	56.99	3 10.40	0.862	11 18 0.84
Wed.	11	11 18 26.24	8.989	4 28 30.2	57.19	3 31.16	0.868	11 21 57.40
Thur.	12	11 22 1.91	8.984	4 5 35.3	57.38	3 52.04	0.872	11 25 53.95
Fri.	13	11 25 37.47	8.980	3 42 36.2	57.54	4 13.03	0.875	11 29 50.50
Sat.	14	11 29 12.95	8.977	3 19 33.2	57.70	4 34.10	0.878	11 33 47.05
Sun.	15	11 32 48.36	8.974	2 56 26.7	57.84	4 55.25	0.880	11 37 43.61
Mon.	16	11 36 23.73	8.973	2 33 16.9	57.97	5 16.43	0.882	11 41 40.16
Tues.	17	11 39 59.08	8.972	2 10 4.1	58.09	5 37.63	0.884	11 45 36.70
Wed.	18	11 43 34.42	8.973	1 46 48.6	58.19	5 58.85	0.882	11 49 33.27
Thur.	19	11 47 9.78	8.974	1 23 30.8	58.29	6 20.04	0.880	11 53 29.82
Fri.	20	11 50 45.19	8.977	1 0 10.9	58.36	6 41.18	0.878	11 57 26.37
Sat.	21	11 54 20.67	8.980	0 36 49.3	58.43	7 2.26	0.875	12 1 22.93
Sun.	22	11 57 56.25	8.985	N. 0 13 26.2	58.48	7 23.23	0.871	12 5 19.48
Mon.	23	12 1 31.95	8.990	S. 0 9 57.9	58.52	7 44.08	0.866	12 9 16.03
Tues.	24	12 5 7.80	8.997	0 33 22.8	58.55	8 4.78	0.860	12 13 12.58
Wed.	25	12 8 43.81	9.004	0 56 48.1	58.56	8 25.33	0.853	12 17 9.14
Thur.	26	12 12 20.01	9.013	1 20 13.4	58.55	8 45.68	0.844	12 21 5.69
Fri.	27	12 15 56.42	9.022	1 43 38.5	58.53	9 5.82	0.834	12 25 2.24
Sat.	28	12 19 33.06	9.032	2 7 3.0	58.49	9 25.74	0.825	12 28 58.80
Sun.	29	12 23 9.95	9.042	2 30 26.4	58.44	9 45.40	0.815	12 32 55.35
Mon.	30	12 26 47.12	9.054	2 53 48.4	58.38	10 4.78	0.804	12 36 51.90
Tues.	31	12 30 24.57	9.066	S. 3 17 8.7	58.31	10 23.88	0.791	12 40 48.45

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										
Day of the Month.	Day of the Year.	True LONGITUDE.				Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		λ		λ'						
		λ	λ'							
1	244	158° 59' 9.5	58° 18.2	145.38	—0.01	0.0037078	43.3	13 15 17.49		
2	245	159 57 19.4	56 28.0	145.45	0.14	.0036029	44.0	13 11 21.58		
3	246	160 55 31.1	54 39.6	145.52	0.25	.0034963	44.7	13 7 25.67		
4	247	161 53 44.6	52 53.0	145.59	0.34	.0033881	45.4	13 3 29.76		
5	248	162 51 59.9	51 8.2	145.66	0.40	.0032783	46.0	12 59 33.86		
6	249	163 50 17.0	49 25.2	145.73	0.42	.0031670	46.7	12 55 37.96		
7	250	164 48 35.8	47 43.9	145.80	0.41	.0030541	47.3	12 51 42.05		
8	251	165 46 56.2	46 4.2	145.87	0.37	.0029397	47.9	12 47 46.14		
9	252	166 45 18.2	44 26.1	145.94	0.31	.0028239	48.4	12 43 50.23		
10	253	167 43 41.7	42 49.5	146.01	0.22	.0027070	48.8	12 39 54.32		
11	254	168 42 6.9	41 14.6	146.08	—0.12	.0025891	49.2	12 35 58.42		
12	255	169 40 33.6	39 41.2	146.15	+0.01	.0024703	49.6	12 32 2.51		
13	256	170 39 2.0	38 9.5	146.22	0.14	.0023508	49.9	12 28 6.60		
14	257	171 37 32.0	36 39.4	146.29	0.27	.0022306	50.1	12 24 10.69		
15	258	172 36 3.7	35 11.0	146.36	0.40	.0021100	50.2	12 20 14.79		
16	259	173 34 37.0	33 44.2	146.43	0.50	.0019890	50.3	12 16 18.89		
17	260	174 33 12.1	32 19.2	146.51	0.58	.0018680	50.4	12 12 22.98		
18	261	175 31 49.0	30 56.0	146.59	0.64	.0017470	50.4	12 8 27.07		
19	262	176 30 27.8	29 34.7	146.67	0.68	.0016260	50.4	12 4 31.16		
20	263	177 29 8.6	28 15.4	146.75	0.68	.0015050	50.4	12 0 35.25		
21	264	178 27 51.4	26 58.1	146.83	0.65	.0013840	50.4	11 56 39.35		
22	265	179 26 36.3	25 42.9	146.92	0.60	.0012630	50.4	11 52 43.44		
23	266	180 25 23.3	24 29.8	147.01	0.51	.0011420	50.4	11 48 47.53		
24	267	181 24 12.6	23 19.0	147.10	0.40	.0010210	50.4	11 44 51.62		
25	268	182 23 4.2	22 10.5	147.20	0.28	.0009000	50.5	11 40 55.72		
26	269	183 21 58.1	21 4.3	147.29	0.15	.0007789	50.5	11 36 59.82		
27	270	184 20 54.2	20 0.3	147.39	+0.01	.0006576	50.6	11 33 3.91		
28	271	185 19 52.6	18 58.6	147.49	—0.12	.0005361	50.7	11 29 8.00		
29	272	186 18 53.3	17 59.2	147.59	0.25	.0004142	50.9	11 25 12.09		
30	273	187 17 56.2	17 2.0	147.68	0.36	.0002917	51.2	11 21 16.18		
31	274	188 17 1.4	16 7.1	147.77	—0.45	0.0001685	51.5	11 17 20.28		

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	15' 38.8	15' 45.8	57' 18.6	+2.13	57' 44.4	+2.14	21 ^h 48.1 ^m	2.16	26.0 ^d
2	15 52.7	15 59.5	58 10.0	2.10	58 34.8	2.01	22 39.4	2.12	27.0
3	16 5.9	16 11.8	58 58.3	1.88	59 19.9	1.71	23 30.1	2.11	28.0
4	16 17.0	16 21.5	59 39.2	1.49	59 55.6	1.23	0 ^h		29.0
5	16 25.1	16 27.7	60 8.7	0.95	60 18.3	0.65	0 20.9	2.13	0.6
6	16 29.3	16 29.9	60 24.3	+0.34	60 26.5	+0.03	1 12.5	2.18	1.6
7	16 29.5	16 28.2	60 25.1	-0.26	60 20.3	-0.53	2 5.9	2.27	2.6
8	16 26.1	16 23.2	60 12.4	0.78	60 1.7	0.99	3 1.7	2.37	3.6
9	16 19.6	16 15.5	59 48.6	1.17	59 33.7	1.31	3 59.8	2.46	4.6
10	16 11.0	16 6.3	59 17.3	1.41	58 59.9	1.48	4 59.6	2.50	5.6
11	16 1.4	15 56.4	58 41.8	1.52	58 23.3	1.54	5 59.4	2.47	6.6
12	15 51.3	15 46.3	58 4.8	1.53	57 46.5	1.51	6 57.6	2.37	7.6
13	15 41.4	15 36.6	57 28.5	1.49	57 10.9	1.45	7 52.7	2.22	8.6
14	15 32.0	15 27.5	56 53.7	1.41	56 37.1	1.36	8 44.2	2.07	9.6
15	15 23.1	15 18.9	56 21.1	1.31	56 5.7	1.25	9 32.1	1.93	10.6
16	15 14.9	15 11.1	55 51.0	1.20	55 37.0	1.14	10 17.2	1.83	11.6
17	15 7.4	15 4.0	55 23.6	1.08	55 11.0	1.02	11 0.3	1.77	12.6
18	15 0.8	14 57.8	54 59.1	0.95	54 48.1	0.88	11 42.2	1.74	13.6
19	14 55.0	14 52.5	54 37.9	0.80	54 28.8	0.71	12 23.8	1.74	14.6
20	14 50.3	14 48.5	54 20.8	0.62	54 14.0	0.51	13 6.0	1.78	15.6
21	14 47.0	14 46.0	54 8.6	0.39	54 4.8	-0.25	13 49.4	1.84	16.6
22	14 45.4	14 45.3	54 2.5	-0.11	54 2.1	+0.05	14 34.6	1.92	17.6
23	14 45.7	14 46.7	54 3.7	+0.22	54 7.4	0.40	15 21.7	2.01	18.6
24	14 48.3	14 50.5	54 13.3	0.59	54 21.4	0.78	16 10.8	2.08	19.6
25	14 53.4	14 56.9	54 32.0	0.98	54 45.0	1.19	17 1.4	2.13	20.6
26	15 1.1	15 6.0	55 0.5	1.39	55 18.3	1.58	17 52.8	2.15	21.6
27	15 11.5	15 17.5	55 38.4	1.76	56 0.6	1.94	18 44.3	2.14	22.6
28	15 24.1	15 31.2	56 24.8	2.09	56 50.8	2.22	19 35.5	2.12	23.6
29	15 38.6	15 46.3	57 18.1	2.31	57 46.3	2.37	20 26.0	2.10	24.6
30	15 54.1	16 1.9	58 15.0	2.38	58 43.5	2.35	21 16.2	2.09	25.6
31	16 9.4	16 16.6	59 11.3	+2.26	59 37.6	+2.11	22 6.6	2.12	26.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	7 44 54.23	2.2761	N.20° 8 55.9	8.653	0	9 32 34.15	2.2129	N.11° 8 51.9	12.497
1	7 47 10.70	2.2789	20 0 13.1	8.773	1	9 34 46.90	2.2130	10 55 20.4	12.592
2	7 49 27.10	2.2797	19 51 23.1	8.893	2	9 36 59.59	2.2111	10 41 44.4	12.686
3	7 51 43.43	2.2716	19 42 25.9	9.012	3	9 39 12.23	2.2108	10 28 4.1	12.707
4	7 53 59.68	2.2709	19 33 21.6	9.130	4	9 41 24.82	2.2096	10 14 19.5	12.778
5	7 56 15.85	2.2689	19 24 10.2	9.248	5	9 43 37.37	2.2087	10 0 30.7	12.848
6	7 58 31.95	2.2676	19 14 51.8	9.366	6	9 45 49.87	2.2079	9 46 37.7	12.917
7	8 0 47.97	2.2668	19 5 26.3	9.482	7	9 48 2.32	2.2072	9 32 40.6	12.984
8	8 3 3.91	2.2660	18 55 53.9	9.598	8	9 50 14.73	2.2066	9 18 39.6	13.049
9	8 5 19.77	2.2656	18 46 14.6	9.713	9	9 52 27.10	2.2060	9 4 34.7	14.113
10	8 7 35.54	2.2638	18 36 28.4	9.827	10	9 54 39.43	2.2048	8 50 26.0	14.176
11	8 9 51.24	2.2609	18 26 35.3	9.940	11	9 56 51.73	2.2047	8 36 13.5	14.238
12	8 12 6.85	2.2595	18 16 35.5	10.053	12	9 59 4.00	2.2042	8 21 57.4	14.298
13	8 14 22.38	2.2561	18 6 28.9	10.166	13	10 1 16.24	2.2037	8 7 37.7	14.367
14	8 16 37.82	2.2567	17 56 15.7	10.276	14	10 3 28.45	2.2033	7 53 14.5	14.416
15	8 18 53.18	2.2563	17 45 55.8	10.387	15	10 5 40.64	2.2029	7 38 47.9	14.471
16	8 21 8.45	2.2539	17 35 29.3	10.497	16	10 7 52.80	2.2026	7 24 18.0	14.526
17	8 23 23.64	2.2526	17 24 56.3	10.606	17	10 10 4.94	2.2022	7 9 44.8	14.580
18	8 25 38.74	2.2511	17 14 16.7	10.713	18	10 12 17.07	2.2019	6 55 8.4	14.632
19	8 27 53.76	2.2497	17 3 30.7	10.821	19	10 14 29.18	2.2017	6 40 29.0	14.682
20	8 30 8.70	2.2468	16 52 38.2	10.928	20	10 16 41.28	2.2016	6 25 46.6	14.731
21	8 32 23.55	2.2468	16 41 39.4	11.033	21	10 18 53.37	2.2016	6 11 1.3	14.778
22	8 34 38.31	2.2464	16 30 34.3	11.137	22	10 21 5.46	2.2014	5 56 13.2	14.824
23	8 36 52.99	2.2439	N.16 19 23.0	11.240	23	10 23 17.54	2.2014	N. 5 41 22.4	14.868
MONDAY 2.					WEDNESDAY 4.				
0	8 39 7.58	2.2426	N.16 8 5.5	11.342	0	10 25 29.63	2.2015	N. 5 26 28.9	14.912
1	8 41 22.09	2.2411	15 56 41.9	11.444	1	10 27 41.72	2.2016	5 11 32.9	14.963
2	8 43 36.51	2.2397	15 45 12.2	11.546	2	10 29 53.82	2.2017	4 56 34.5	14.993
3	8 45 50.85	2.2383	15 33 36.5	11.644	3	10 32 5.92	2.2019	4 41 33.7	15.031
4	8 48 5.11	2.2369	15 21 54.9	11.742	4	10 34 18.04	2.2021	4 26 30.7	15.068
5	8 50 19.29	2.2356	15 10 7.4	11.840	5	10 36 30.18	2.2024	4 11 25.5	15.104
6	8 52 33.38	2.2342	14 58 14.1	11.937	6	10 38 42.33	2.2027	3 56 18.3	15.138
7	8 54 47.39	2.2329	14 46 15.0	12.032	7	10 40 54.50	2.2031	3 41 9.0	15.170
8	8 57 1.32	2.2315	14 34 10.2	12.126	8	10 43 6.70	2.2036	3 25 57.9	15.200
9	8 59 15.17	2.2303	14 21 59.8	12.220	9	10 45 18.93	2.2041	3 10 45.0	15.229
10	9 1 28.94	2.2289	14 9 43.8	12.312	10	10 47 31.19	2.2047	2 55 30.4	15.267
11	9 3 42.63	2.2276	13 57 22.3	12.403	11	10 49 43.49	2.2053	2 40 14.2	15.293
12	9 5 56.25	2.2263	13 44 55.4	12.493	12	10 51 55.82	2.2059	2 24 56.4	15.307
13	9 8 9.79	2.2251	13 32 23.1	12.583	13	10 54 8.19	2.2068	2 9 37.3	15.330
14	9 10 23.26	2.2238	13 19 45.4	12.671	14	10 56 20.61	2.2074	1 54 16.8	15.361
15	9 12 36.65	2.2226	13 7 2.5	12.757	15	10 58 33.08	2.2083	1 38 55.1	15.371
16	9 14 49.97	2.2214	12 54 14.5	12.843	16	11 0 45.60	2.2092	1 23 32.3	15.398
17	9 17 3.22	2.2203	12 41 21.3	12.928	17	11 2 58.18	2.2101	1 8 8.5	15.408
18	9 19 16.40	2.2192	12 28 23.1	13.012	18	11 5 10.81	2.2111	0 52 43.7	15.419
19	9 21 29.52	2.2181	12 15 19.9	13.094	19	11 7 23.50	2.2121	0 37 18.1	15.429
20	9 23 42.57	2.2170	12 2 11.8	13.175	20	11 9 36.26	2.2133	0 21 51.8	15.443
21	9 25 55.56	2.2159	11 48 58.9	13.256	21	11 11 49.09	2.2144	N. 0 6 24.9	15.463
22	9 28 8.48	2.2149	11 35 41.2	13.334	22	11 14 1.99	2.2157	S. 0 9 2.6	15.461
23	9 30 21.34	2.2139	11 22 18.9	13.411	23	11 16 14.97	2.2170	0 24 30.5	15.468
24	9 32 34.15	2.2129	N.11 8 51.9	13.487	24	11 18 28.03	2.2183	S. 0 39 58.8	15.473

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	h m s	"	S. ° ' "	"	0	h m s	"	S. ° ' "	"
1	11 18 28.03	2.3183	0 39' 58.8	15.473	1	13 7 31.93	2.3449	12 35' 8.3	13.954
2	11 20 41.17	2.3197	0 55' 27.3	15.476	2	13 9 52.73	2.3486	12 48' 45.1	13.973
3	11 22 54.40	2.3211	1 10' 55.9	15.477	3	13 12 13.76	2.3523	13 2' 17.1	13.990
4	11 25 7.71	2.3226	1 26' 24.5	15.478	4	13 14 35.01	2.3560	13 15' 44.1	13.996
5	11 27 21.12	2.3242	1 41' 53.0	15.474	5	13 16 56.48	2.3598	13 29' 5.9	13.990
6	11 29 34.62	2.3258	1 57' 21.3	15.470	6	13 19 18.18	2.3636	13 42' 22.5	13.983
7	11 31 48.22	2.3275	2 12' 49.4	15.466	7	13 21 40.11	2.3674	13 55' 33.9	13.974
8	11 34 1.93	2.3293	2 28' 17.1	15.466	8	13 24 2.27	2.3712	14 8' 39.9	13.964
9	11 36 15.74	2.3311	2 43' 44.3	15.449	9	13 26 24.65	2.3750	14 21' 40.4	13.952
10	11 38 29.66	2.3329	2 59' 10.9	15.438	10	13 28 47.26	2.3789	14 34' 35.3	13.938
11	11 40 43.69	2.3348	3 14' 36.8	15.436	11	13 31 10.11	2.3827	14 47' 24.5	13.922
12	11 42 57.84	2.3368	3 30' 1.9	15.411	12	13 33 33.19	2.3866	15 0' 8.0	13.906
13	11 45 12.11	2.3388	3 45' 26.1	15.385	13	13 35 56.50	2.3904	15 12' 45.6	13.878
14	11 47 26.50	2.3409	4 0' 49.3	15.378	14	13 38 20.04	2.3943	15 25' 17.2	13.876
15	11 49 41.02	2.3430	4 16' 11.4	15.369	15	13 40 43.82	2.3982	15 37' 42.7	13.874
16	11 51 55.67	2.3452	4 31' 32.3	15.357	16	13 43 7.83	2.4021	15 50' 2.1	13.871
17	11 54 10.45	2.3475	4 46' 51.8	15.344	17	13 45 32.07	2.4060	16 2' 15.2	13.866
18	11 56 25.36	2.3498	5 2' 9.9	15.329	18	13 47 56.55	2.4099	16 14' 21.9	13.860
19	11 58 40.42	2.3522	5 17' 26.5	15.313	19	13 50 21.26	2.4138	16 26' 22.2	13.851
20	12 0 55.62	2.3546	5 32' 41.5	15.294	20	13 52 46.21	2.4177	16 38' 16.0	13.841
21	12 3 10.97	2.3571	5 47' 54.7	15.266	21	13 55 11.39	2.4216	16 50' 3.1	13.830
22	12 5 26.47	2.3596	6 3' 6.1	15.179	22	13 57 36.81	2.4256	17 1' 43.5	13.817
23	12 7 42.12	2.3622	6 18' 15.5	15.139	23	14 0 2.46	2.4294	17 13' 17.1	13.802
24	12 9 57.93	2.3648	S. 6 33' 22.8	15.104	24	14 2 28.34	2.4333	S. 17 24' 43.7	13.886
FRIDAY 6.					SUNDAY 8.				
0	h m s	"	S. ° ' "	"	0	h m s	"	S. ° ' "	"
1	12 12 13.89	2.3675	6 48' 28.0	15.067	1	14 4 54.45	2.4372	17 36' 3.4	13.869
2	12 14 30.02	2.3702	7 3' 30.9	15.028	2	14 7 20.79	2.4410	17 47' 16.0	13.850
3	12 16 46.31	2.3730	7 18' 31.4	14.988	3	14 9 47.37	2.4449	17 58' 21.4	13.830
4	12 19 2.77	2.3758	7 33' 29.4	14.946	4	14 12 14.17	2.4488	18 9' 19.6	13.809
5	12 21 19.40	2.3786	7 48' 24.9	14.903	5	14 14 41.20	2.4524	18 20' 10.5	13.786
6	12 23 36.20	2.3815	8 3' 17.7	14.866	6	14 17 8.46	2.4562	18 30' 54.0	13.761
7	12 25 53.18	2.3845	8 18' 7.7	14.808	7	14 19 35.94	2.4599	18 41' 29.9	13.736
8	12 28 10.34	2.3875	8 32' 54.7	14.769	8	14 22 3.64	2.4636	18 51' 58.2	13.708
9	12 30 27.68	2.3906	8 47' 38.7	14.708	9	14 24 31.56	2.4672	19 2' 18.9	13.680
10	12 32 45.21	2.3937	9 2' 19.6	14.665	10	14 26 59.70	2.4708	19 12' 31.8	13.650
11	12 35 2.92	2.3968	9 16' 57.3	14.600	11	14 29 28.06	2.4744	19 22' 36.9	13.619
12	12 37 20.82	2.3999	9 31' 31.7	14.544	12	14 31 56.63	2.4780	19 32' 34.1	13.587
13	12 39 38.91	2.4032	9 46' 2.6	14.486	13	14 34 25.42	2.4816	19 42' 23.3	13.553
14	12 41 57.20	2.4066	10 0' 30.0	14.427	14	14 36 54.42	2.4851	19 52' 4.5	13.518
15	12 44 15.69	2.4099	10 14' 53.8	14.365	15	14 39 23.63	2.4885	20 1' 37.5	13.482
16	12 46 34.38	2.4133	10 29' 13.8	14.302	16	14 41 53.04	2.4919	20 11' 2.3	13.446
17	12 48 53.27	2.4166	10 43' 30.0	14.237	17	14 44 22.66	2.4953	20 20' 18.9	13.407
18	12 51 12.37	2.4200	10 57' 42.2	14.170	18	14 46 52.48	2.4986	20 29' 27.1	13.367
19	12 53 31.67	2.4236	11 11' 50.4	14.101	19	14 49 22.49	2.5019	20 38' 26.9	13.326
20	12 55 51.18	2.4270	11 25' 54.4	14.031	20	14 51 52.70	2.5051	20 47' 18.3	13.285
21	12 58 10.90	2.4306	11 39' 54.1	13.960	21	14 54 23.10	2.5082	20 56' 1.1	13.243
22	13 0 30.83	2.4341	11 53' 49.5	13.886	22	14 56 53.69	2.5113	21 4' 35.3	13.198
23	13 2 50.96	2.4377	12 7' 40.4	13.811	23	14 59 24.46	2.5143	21 13' 0.9	13.153
24	13 5 11.35	2.4413	12 21' 26.7	13.733	24	15 1 55.41	2.5173	21 21' 17.7	13.107
	13 7 31.93	2.4449	S. 12 35' 8.3	13.654		15 4 26.53	2.5203	S. 21 29' 25.7	13.060

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	15 4 26.53	2.5902	S.21° 29' 25.7"	6.000	0	17 7 5.49	2.5906	S.24° 54' 2.0"	0.343
1	15 6 57.83	2.5920	21 37 24.9	7.012	1	17 9 38.46	2.5935	24 54 17.7	0.180
2	15 9 29.29	2.5938	21 45 15.1	7.763	2	17 12 11.31	2.5964	24 54 23.6	0.017
3	15 12 0.92	2.5955	21 52 56.4	7.613	3	17 14 44.03	2.5993	24 54 19.8	0.145
4	15 14 32.71	2.5911	22 0 28.6	7.462	4	17 17 16.61	2.6018	24 54 6.2	0.307
5	15 17 4.65	2.5936	22 7 51.8	7.310	5	17 19 49.04	2.5993	24 53 43.0	0.468
6	15 19 36.74	2.5961	22 15 5.8	7.157	6	17 22 21.32	2.5967	24 53 10.1	0.628
7	15 22 8.98	2.5985	22 22 10.6	7.003	7	17 24 53.45	2.5941	24 52 27.6	0.788
8	15 24 41.36	2.5908	22 29 6.2	6.848	8	17 27 25.41	2.5913	24 51 35.6	0.947
9	15 27 13.87	2.5930	22 35 52.5	6.693	9	17 29 57.20	2.5884	24 50 34.0	1.106
10	15 29 46.52	2.5951	22 42 29.4	6.537	10	17 32 28.82	2.5854	24 49 22.9	1.264
11	15 32 19.29	2.5973	22 48 57.0	6.381	11	17 35 0.25	2.5823	24 48 2.3	1.422
12	15 34 52.19	2.5992	22 55 15.2	6.224	12	17 37 31.50	2.5791	24 46 32.3	1.579
13	15 37 25.20	2.5911	23 1 23.9	6.066	13	17 40 2.55	2.5758	24 44 52.9	1.735
14	15 39 58.32	2.5928	23 7 23.2	5.907	14	17 42 33.40	2.5724	24 43 4.1	1.890
15	15 42 31.54	2.5945	23 13 12.9	5.748	15	17 45 4.04	2.5688	24 41 6.0	2.045
16	15 45 4.86	2.5961	23 18 53.0	5.588	16	17 47 34.47	2.5653	24 38 58.7	2.199
17	15 47 38.27	2.5976	23 24 23.5	5.428	17	17 50 4.08	2.5617	24 36 42.1	2.352
18	15 50 11.77	2.5990	23 29 44.4	5.268	18	17 52 34.67	2.5579	24 34 16.4	2.505
19	15 52 45.35	2.6003	23 34 55.6	5.107	19	17 55 4.43	2.5540	24 31 41.5	2.657
20	15 55 19.01	2.6015	23 39 57.2	4.945	20	17 57 33.95	2.5501	24 28 57.5	2.808
21	15 57 52.73	2.6026	23 44 49.0	4.783	21	18 0 3.24	2.5461	24 26 4.5	2.958
22	16 0 26.52	2.6036	23 49 31.1	4.620	22	18 2 32.28	2.5420	24 23 2.5	3.107
23	16 3 0.36	2.6044	S.23° 54' 3.4"	4.457	23	18 5 1.07	2.5378	S.24° 19' 51.6"	3.256
TUESDAY 10.					THURSDAY 12.				
0	16 5 34.25	2.6052	S.23° 58' 26.0"	4.294	0	18 7 29.61	2.4785	S.24° 16' 31.8"	3.404
1	16 8 8.19	2.6069	24 2 38.7	4.130	1	18 9 57.89	2.4691	24 13 3.2	3.550
2	16 10 42.16	2.6085	24 6 41.6	3.966	2	18 12 25.91	2.4647	24 9 25.8	3.696
3	16 13 16.16	2.6099	24 10 34.7	3.802	3	18 14 53.66	2.4603	24 5 39.7	3.841
4	16 15 50.19	2.6073	24 14 17.9	3.638	4	18 17 21.13	2.4556	24 1 44.9	3.985
5	16 18 24.24	2.6076	24 17 51.2	3.473	5	18 19 48.32	2.4510	23 57 41.5	4.128
6	16 20 58.30	2.6077	24 21 14.6	3.308	6	18 22 15.24	2.4463	23 53 29.6	4.270
7	16 23 32.36	2.6077	24 24 28.1	3.143	7	18 24 41.87	2.4415	23 49 9.2	4.410
8	16 26 6.42	2.6076	24 27 31.7	2.978	8	18 27 8.22	2.4366	23 44 40.4	4.549
9	16 28 40.47	2.6074	24 30 25.4	2.813	9	18 29 34.27	2.4317	23 40 3.2	4.688
10	16 31 14.51	2.6071	24 33 9.1	2.647	10	18 32 0.02	2.4267	23 35 17.8	4.828
11	16 33 48.53	2.6067	24 35 42.9	2.481	11	18 34 25.48	2.4217	23 30 24.1	4.968
12	16 36 22.51	2.6061	24 38 6.8	2.316	12	18 36 50.63	2.4166	23 25 22.2	5.109
13	16 38 56.46	2.6054	24 40 20.8	2.150	13	18 39 15.48	2.4115	23 20 12.2	5.248
14	16 41 30.36	2.6045	24 42 24.8	1.985	14	18 41 40.01	2.4063	23 14 54.2	5.388
15	16 44 4.21	2.6037	24 44 18.9	1.820	15	18 44 4.23	2.4010	23 9 28.2	5.528
16	16 46 38.01	2.6027	24 46 3.1	1.655	16	18 46 28.13	2.3957	23 3 54.4	5.669
17	16 49 11.74	2.6016	24 47 37.5	1.490	17	18 48 51.71	2.3904	22 58 12.7	5.799
18	16 51 45.40	2.6004	24 49 2.0	1.325	18	18 51 14.96	2.3851	22 52 23.2	5.939
19	16 54 18.98	2.5990	24 50 16.6	1.161	19	18 53 37.92	2.3797	22 46 26.0	6.077
20	16 56 52.48	2.5975	24 51 21.3	0.997	20	18 56 0.54	2.3743	22 40 21.2	6.214
21	16 59 25.88	2.5959	24 52 16.2	0.833	21	18 58 22.83	2.3687	22 34 8.8	6.350
22	17 1 59.19	2.5942	24 53 1.3	0.669	22	19 0 44.78	2.3632	22 27 49.0	6.486
23	17 4 32.40	2.5926	24 53 36.6	0.505	23	19 3 6.40	2.3576	22 21 21.7	6.621
24	17 7 5.49	2.5906	S.24° 54' 2.0"	0.343	24	19 5 27.09	2.3520	S.22° 14' 47.1"	6.756

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	19 5 27.69	2.2420	S. 22° 14' 47.1"	6.538	0	20 51 46.97	2.0832	S. 14° 58' 56.6"	11.050
1	19 7 48.64	2.2464	22 8 5.2	6.758	1	20 53 51.81	2.0782	14 47 51.7	11.113
2	19 10 9.25	2.2408	22 1 16.1	6.877	2	20 55 56.35	2.0732	14 36 43.0	11.176
3	19 12 29.53	2.2351	21 54 19.8	6.996	3	20 58 0.59	2.0683	14 25 30.7	11.238
4	19 14 49.46	2.2394	21 47 16.5	7.113	4	21 0 4.54	2.0634	14 14 14.8	11.294
5	19 17 9.05	2.2336	21 40 6.2	7.229	5	21 2 8.20	2.0586	14 2 55.4	11.352
6	19 19 28.29	2.2179	21 32 48.9	7.344	6	21 4 11.57	2.0539	13 51 32.6	11.409
7	19 21 47.19	2.2122	21 25 24.8	7.457	7	21 6 14.66	2.0492	13 40 6.4	11.464
8	19 24 5.75	2.2064	21 17 54.0	7.569	8	21 8 17.47	2.0445	13 28 36.9	11.518
9	19 26 23.96	2.2006	21 10 16.5	7.681	9	21 10 20.00	2.0399	13 17 4.2	11.572
10	19 28 41.82	2.2048	21 2 32.3	7.791	10	21 12 22.25	2.0353	13 5 28.3	11.624
11	19 30 59.34	2.2091	20 54 41.5	7.900	11	21 14 24.23	2.0307	12 53 49.3	11.676
12	19 33 16.51	2.2033	20 46 44.3	8.007	12	21 16 25.93	2.0262	12 42 7.3	11.725
13	19 35 33.33	2.2774	20 38 40.7	8.113	13	21 18 27.37	2.0218	12 30 22.3	11.774
14	19 37 49.80	2.2716	20 30 30.8	8.218	14	21 20 28.54	2.0174	12 18 34.4	11.822
15	19 40 5.92	2.2658	20 22 14.6	8.323	15	21 22 29.45	2.0131	12 6 43.7	11.868
16	19 42 21.70	2.2600	20 13 52.2	8.424	16	21 24 30.11	2.0088	11 54 50.2	11.914
17	19 44 37.12	2.2543	20 5 23.7	8.525	17	21 26 30.51	2.0046	11 42 54.0	11.959
18	19 46 52.20	2.2484	19 56 49.2	8.625	18	21 28 30.65	2.0004	11 30 55.1	12.003
19	19 49 6.93	2.2426	19 48 8.7	8.723	19	21 30 30.55	1.9963	11 18 53.7	12.045
20	19 51 21.31	2.2368	19 39 22.3	8.820	20	21 32 30.20	1.9922	11 6 49.7	12.088
21	19 53 35.34	2.2309	19 30 30.2	8.917	21	21 34 29.61	1.9881	10 54 43.3	12.127
22	19 55 49.02	2.2251	19 21 32.3	9.012	22	21 36 28.77	1.9841	10 42 34.5	12.166
23	19 58 2.36	2.2194	S. 19° 12' 28.7"	9.106	23	21 38 27.70	1.9802	S. 10° 30' 23.4"	12.204
SATURDAY 14.					MONDAY 16.				
0	20 0 15.85	2.2136	S. 19° 3' 19.6"	9.196	0	21 40 26.39	1.9764	S. 10° 18' 10.0"	12.241
1	20 2 27.99	2.2078	18 54 5.0	9.289	1	21 42 24.86	1.9726	10 5 54.4	12.277
2	20 4 40.29	2.2021	18 44 44.9	9.379	2	21 44 23.10	1.9688	9 53 36.7	12.312
3	20 6 52.25	2.1964	18 35 19.4	9.468	3	21 46 21.11	1.9651	9 41 16.9	12.347
4	20 9 3.87	2.1907	18 25 48.7	9.556	4	21 48 18.91	1.9615	9 28 55.0	12.380
5	20 11 15.15	2.1851	18 16 12.8	9.642	5	21 50 16.49	1.9579	9 16 31.2	12.412
6	20 13 26.09	2.1795	18 6 31.7	9.727	6	21 52 13.86	1.9544	9 4 5.5	12.443
7	20 15 36.69	2.1739	17 56 45.5	9.811	7	21 54 11.02	1.9510	8 51 38.0	12.473
8	20 17 46.96	2.1683	17 46 54.4	9.893	8	21 56 7.98	1.9476	8 39 8.7	12.502
9	20 19 56.90	2.1626	17 36 58.4	9.974	9	21 58 4.74	1.9443	8 26 37.7	12.531
10	20 22 6.50	2.1570	17 26 57.5	10.054	10	22 0 1.30	1.9410	8 14 5.0	12.568
11	20 24 15.77	2.1517	17 16 51.8	10.133	11	22 1 57.66	1.9378	8 1 30.7	12.584
12	20 26 24.71	2.1462	17 6 41.5	10.211	12	22 3 53.83	1.9346	7 48 54.9	12.609
13	20 28 33.32	2.1408	16 56 26.5	10.287	13	22 5 49.81	1.9315	7 36 17.6	12.634
14	20 30 41.61	2.1354	16 46 7.0	10.362	14	22 7 45.61	1.9284	7 23 38.8	12.657
15	20 32 49.57	2.1300	16 35 43.0	10.437	15	22 9 41.22	1.9254	7 10 58.7	12.679
16	20 34 57.21	2.1246	16 25 14.5	10.510	16	22 11 36.66	1.9223	6 58 17.3	12.700
17	20 37 4.53	2.1192	16 14 41.7	10.582	17	22 13 31.92	1.9193	6 45 34.6	12.721
18	20 39 11.53	2.1140	16 4 4.6	10.653	18	22 15 27.01	1.9167	6 32 50.7	12.741
19	20 41 18.21	2.1087	15 53 23.4	10.722	19	22 17 21.93	1.9139	6 20 5.7	12.759
20	20 43 24.58	2.1036	15 42 38.0	10.790	20	22 19 16.68	1.9112	6 7 19.6	12.777
21	20 45 30.64	2.0984	15 31 48.5	10.857	21	22 21 11.27	1.9086	5 54 32.5	12.794
22	20 47 36.39	2.0933	15 20 55.1	10.923	22	22 23 5.71	1.9060	5 41 44.3	12.810
23	20 49 41.83	2.0882	15 9 57.8	10.987	23	22 24 59.99	1.9034	5 28 55.2	12.826
24	20 51 46.97	2.0832	S. 14° 58' 56.6"	11.050	24	22 26 54.12	1.9009	S. 5° 16' 5.3"	12.839

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	^h 22 ^m 26 ^s 54.12	1.9009	S. 5° 16' 5.3"	12.9899	0	^h 23 ^m 56 ^s 23.75	1.8499	N. 4° 59' 46.5"	12.906
1	22 28 48.10	1.9005	5 3 14.6	12.9892	1	23 58 14.74	1.8499	5 12 16.1	12.479
2	22 30 41.94	1.9003	4 50 23.1	12.9884	2	0 0 5.74	1.8503	5 24 44.0	12.452
3	22 32 35.64	1.9000	4 37 30.9	12.976	3	0 1 56.76	1.8506	5 37 10.3	12.424
4	22 34 29.21	1.8917	4 24 38.1	12.986	4	0 3 47.81	1.8510	5 49 34.9	12.396
5	22 36 22.65	1.8906	4 11 44.7	12.984	5	0 5 38.88	1.8516	6 1 57.7	12.368
6	22 38 15.95	1.8974	3 58 50.8	12.980	6	0 7 29.99	1.8521	6 14 18.8	12.339
7	22 40 9.13	1.8963	3 45 56.4	12.911	7	0 9 21.13	1.8527	6 26 38.0	12.311
8	22 42 2.18	1.8953	3 33 1.5	12.918	8	0 11 12.31	1.8533	6 38 55.3	12.279
9	22 43 55.12	1.8913	3 20 6.3	12.923	9	0 13 3.53	1.8540	6 51 10.7	12.249
10	22 45 47.94	1.8794	3 7 10.7	12.928	10	0 14 54.79	1.8547	7 3 24.1	12.207
11	22 47 40.65	1.8776	2 54 14.9	12.933	11	0 16 46.10	1.8556	7 15 35.5	12.173
12	22 49 33.25	1.8756	2 41 18.8	12.935	12	0 18 37.45	1.8563	7 27 44.9	12.138
13	22 51 25.75	1.8741	2 28 22.6	12.938	13	0 20 28.86	1.8573	7 39 52.1	12.103
14	22 53 18.15	1.8734	2 15 26.2	12.940	14	0 22 20.32	1.8581	7 51 57.2	12.068
15	22 55 10.45	1.8706	2 2 29.8	12.941	15	0 24 11.83	1.8591	8 4 0.1	12.030
16	22 57 2.65	1.8690	1 49 33.3	12.941	16	0 26 3.41	1.8603	8 16 0.8	11.992
17	22 58 54.76	1.8678	1 36 36.9	12.940	17	0 27 55.05	1.8613	8 27 59.2	11.953
18	23 0 46.79	1.8664	1 23 40.5	12.938	18	0 29 46.76	1.8624	8 39 55.2	11.914
19	23 2 38.73	1.8650	1 10 44.3	12.935	19	0 31 38.53	1.8636	8 51 48.9	11.874
20	23 4 30.59	1.8637	0 57 48.3	12.932	20	0 33 30.38	1.8647	9 3 40.1	11.833
21	23 6 22.37	1.8624	0 44 52.5	12.928	21	0 35 22.30	1.8659	9 15 28.8	11.792
22	23 8 14.08	1.8613	0 31 57.0	12.923	22	0 37 14.30	1.8673	9 27 15.1	11.750
23	23 10 5.72	1.8601	S. 0° 19' 1.9"	12.916	23	0 39 6.38	1.8687	N. 9° 38' 58.8"	11.707
WEDNESDAY 18.					FRIDAY 20.				
0	23 11 57.29	1.8590	S. 0° 6' 7.1"	12.909	0	0 40 58.55	1.8701	N. 9° 50' 40.0"	11.668
1	23 13 48.80	1.8580	N. 0° 6' 47.2"	12.901	1	0 42 50.80	1.8716	10 2 18.5	11.639
2	23 15 40.25	1.8570	0 19 41.1	12.892	2	0 44 43.14	1.8731	10 13 54.3	11.574
3	23 17 31.64	1.8561	0 32 34.4	12.883	3	0 46 35.57	1.8746	10 25 27.4	11.529
4	23 19 22.98	1.8552	0 45 27.1	12.873	4	0 48 28.09	1.8762	10 36 57.8	11.483
5	23 21 14.27	1.8544	0 58 19.2	12.862	5	0 50 20.71	1.8778	10 48 25.4	11.436
6	23 23 5.51	1.8537	1 11 10.6	12.851	6	0 52 13.42	1.8794	10 59 50.1	11.388
7	23 24 56.71	1.8530	1 24 1.3	12.839	7	0 54 6.23	1.8811	11 11 11.9	11.339
8	23 26 47.88	1.8524	1 36 51.3	12.826	8	0 55 59.15	1.8828	11 22 30.8	11.289
9	23 28 39.01	1.8518	1 49 40.4	12.813	9	0 57 52.17	1.8846	11 33 46.7	11.240
10	23 30 30.10	1.8513	2 2 28.7	12.797	10	0 59 45.30	1.8864	11 44 59.6	11.189
11	23 32 21.17	1.8509	2 15 16.0	12.781	11	1 1 38.54	1.8883	11 56 9.4	11.138
12	23 34 12.21	1.8505	2 28 2.4	12.764	12	1 3 31.90	1.8902	12 7 16.1	11.085
13	23 36 3.23	1.8501	2 40 47.8	12.747	13	1 5 25.37	1.8922	12 18 19.6	11.033
14	23 37 54.22	1.8496	2 53 32.1	12.730	14	1 7 18.96	1.8942	12 29 20.0	10.979
15	23 39 45.20	1.8490	3 6 15.3	12.710	15	1 9 12.67	1.8963	12 40 17.1	10.925
16	23 41 36.16	1.8484	3 18 57.3	12.690	16	1 11 6.50	1.8983	12 51 11.0	10.870
17	23 43 27.11	1.8479	3 31 38.1	12.670	17	1 13 0.46	1.9004	13 2 1.5	10.814
18	23 45 18.06	1.8471	3 44 17.7	12.649	18	1 14 54.54	1.9026	13 12 48.7	10.758
19	23 47 9.00	1.8460	3 56 56.0	12.628	19	1 16 48.75	1.9047	13 23 32.5	10.701
20	23 48 59.94	1.8450	4 9 33.0	12.606	20	1 18 43.10	1.9069	13 34 12.8	10.643
21	23 50 50.88	1.8441	4 22 8.6	12.581	21	1 20 37.58	1.9092	13 44 49.6	10.584
22	23 52 41.83	1.8432	4 34 42.7	12.556	22	1 22 32.20	1.9116	13 55 22.9	10.525
23	23 54 32.78	1.8424	4 47 15.4	12.531	23	1 24 26.96	1.9140	14 5 52.6	10.465
24	23 56 23.75	1.8416	N. 4° 59' 46.5"	12.506	24	1 26 21.85	1.9165	N. 14° 16' 18.7"	10.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	1 ^h 26 ^m 21.85	1.9161	N.14° 16' 18.7	10.404	0	3 ^h 1 ^m 32.99	2.0568	N.21° 12' 44.4	6.087
1	1 28 16.89	1.9165	14 26 41.1	10.343	1	3 3 36.49	2.0600	21 19 22.8	6.523
2	1 30 12.07	1.9200	14 36 59.9	10.261	2	3 5 40.18	2.0632	21 25 55.6	6.439
3	1 32 7.40	1.9233	14 47 14.9	10.218	3	3 7 44.07	2.0663	21 32 22.7	6.404
4	1 34 2.87	1.9265	14 57 26.1	10.166	4	3 9 48.15	2.0694	21 38 44.0	6.366
5	1 35 58.49	1.9298	15 7 33.5	10.091	5	3 11 52.42	2.0727	21 44 59.6	6.319
6	1 37 54.27	1.9309	15 17 37.0	10.036	6	3 13 56.88	2.0760	21 51 9.4	6.116
7	1 39 50.20	1.9336	15 27 36.8	9.961	7	3 16 1.53	2.0791	21 57 13.4	6.018
8	1 41 46.29	1.9361	15 37 32.3	9.896	8	3 18 6.37	2.0823	22 3 11.5	5.920
9	1 43 42.53	1.9387	15 47 24.0	9.838	9	3 20 11.40	2.0855	22 9 3.7	5.821
10	1 45 38.93	1.9414	15 57 11.6	9.790	10	3 22 16.62	2.0887	22 14 50.0	5.722
11	1 47 35.49	1.9441	16 6 55.1	9.701	11	3 24 22.03	2.0918	22 20 30.4	5.622
12	1 49 32.22	1.9468	16 16 34.5	9.623	12	3 26 27.63	2.0949	22 26 4.7	5.522
13	1 51 29.11	1.9496	16 26 9.7	9.553	13	3 28 33.42	2.0980	22 31 33.0	5.421
14	1 53 26.16	1.9523	16 35 40.8	9.483	14	3 30 39.39	2.1011	22 36 55.2	5.320
15	1 55 23.38	1.9551	16 45 7.6	9.412	15	3 32 45.54	2.1041	22 42 11.3	5.218
16	1 57 20.77	1.9579	16 54 30.2	9.340	16	3 34 51.88	2.1073	22 47 21.3	5.116
17	1 59 18.33	1.9606	17 3 48.4	9.267	17	3 36 58.40	2.1103	22 52 25.1	5.011
18	2 1 16.06	1.9637	17 13 2.3	9.193	18	3 39 5.11	2.1133	22 57 22.6	4.907
19	2 3 13.97	1.9666	17 22 11.7	9.119	19	3 41 12.00	2.1163	23 2 13.9	4.803
20	2 5 12.05	1.9696	17 31 16.6	9.045	20	3 43 19.07	2.1193	23 6 58.9	4.698
21	2 7 10.31	1.9724	17 40 17.1	8.970	21	3 45 26.31	2.1223	23 11 37.6	4.592
22	2 9 8.74	1.9753	17 49 13.0	8.894	22	3 47 33.73	2.1253	23 16 9.9	4.486
23	2 11 7.25	1.9783	N.17° 58' 4.4	8.817	23	3 49 41.33	2.1283	N.23° 20' 35.9	4.379
SUNDAY 22.					TUESDAY 24.				
0	2 13 6.14	1.9813	N.18° 6' 51.2	8.740	0	3 51 49.11	2.1311	N.23° 24' 55.4	4.272
1	2 15 5.11	1.9843	18 15 33.3	8.663	1	3 53 57.06	2.1340	23 29 8.5	4.164
2	2 17 4.26	1.9873	18 24 10.7	8.584	2	3 56 5.18	2.1369	23 33 15.1	4.056
3	2 19 3.59	1.9904	18 32 43.4	8.505	3	3 58 13.48	2.1397	23 37 15.2	3.947
4	2 21 3.11	1.9934	18 41 11.3	8.426	4	4 0 21.94	2.1425	23 41 8.8	3.838
5	2 23 2.81	1.9965	18 49 34.4	8.344	5	4 2 30.57	2.1453	23 44 55.8	3.728
6	2 25 2.69	1.9996	18 57 52.6	8.263	6	4 4 39.37	2.1480	23 48 36.2	3.618
7	2 27 2.76	2.0027	19 6 5.9	8.181	7	4 6 48.33	2.1507	23 52 10.0	3.507
8	2 29 3.02	2.0058	19 14 14.3	8.098	8	4 8 57.45	2.1534	23 55 37.1	3.396
9	2 31 3.47	2.0090	19 22 17.7	8.016	9	4 11 6.73	2.1560	23 58 57.5	3.284
10	2 33 4.10	2.0121	19 30 16.1	7.931	10	4 13 16.17	2.1586	24 2 11.2	3.173
11	2 35 4.92	2.0153	19 38 9.4	7.846	11	4 15 25.77	2.1613	24 5 18.2	3.060
12	2 37 5.93	2.0184	19 45 57.6	7.761	12	4 17 35.52	2.1639	24 8 18.4	2.947
13	2 39 7.13	2.0216	19 53 40.7	7.676	13	4 19 45.42	2.1663	24 11 11.8	2.833
14	2 41 8.52	2.0248	20 1 18.6	7.590	14	4 21 55.48	2.1688	24 13 58.4	2.719
15	2 43 10.10	2.0280	20 8 51.3	7.501	15	4 24 5.69	2.1713	24 16 38.1	2.604
16	2 45 11.88	2.0312	20 16 18.7	7.413	16	4 26 16.04	2.1737	24 19 10.9	2.489
17	2 47 13.85	2.0344	20 23 40.8	7.324	17	4 28 26.54	2.1761	24 21 36.8	2.374
18	2 49 16.01	2.0376	20 30 57.6	7.235	18	4 30 37.18	2.1785	24 23 55.8	2.258
19	2 51 18.26	2.0408	20 38 9.1	7.145	19	4 32 47.96	2.1808	24 26 7.8	2.142
20	2 53 20.90	2.0440	20 45 15.1	7.055	20	4 34 58.88	2.1831	24 28 12.9	2.026
21	2 55 23.63	2.0473	20 52 15.7	6.964	21	4 37 9.93	2.1855	24 30 10.9	1.909
22	2 57 26.56	2.0504	20 59 10.8	6.873	22	4 39 21.12	2.1878	24 32 1.9	1.791
23	2 59 29.68	2.0536	21 6 0.4	6.780	23	4 41 32.44	2.1897	24 33 45.8	1.673
24	3 1 32.99	2.0568	N.21° 12' 44.4	6.687	24	4 43 43.89	2.1918	N.24° 35' 22.7	1.555

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	4 ^h 43 ^m 43.89	2.1918	N.24° 35' 22.7"	1.565	0	6 ^h 30 ^m 31.27	2.2300	N.23° 29' 5.2"	4.370
1	4 45 55.46	2.1930	24 36 52.5	1.487	1	6 32 45.66	2.2308	23 24 39.3	4.484
2	4 48 7.16	2.1940	24 38 15.1	1.318	2	6 35 0.05	2.2307	23 20 5.9	4.619
3	4 50 18.98	2.1979	24 39 30.6	1.199	3	6 37 14.43	2.2306	23 15 25.1	4.748
4	4 52 30.91	2.1990	24 40 39.0	1.080	4	6 39 28.79	2.2308	23 10 36.8	4.887
5	4 54 42.96	2.2018	24 41 40.2	0.960	5	6 41 43.14	2.2308	23 5 41.1	4.981
6	4 56 55.12	2.2037	24 42 34.2	0.840	6	6 43 57.47	2.2307	23 0 37.9	5.116
7	4 59 7.40	2.2066	24 43 21.0	0.719	7	6 46 11.79	2.2304	22 55 27.3	5.238
8	5 1 19.78	2.2073	24 44 0.5	0.598	8	6 48 26.08	2.2300	22 50 9.3	5.362
9	5 3 32.27	2.2090	24 44 32.8	0.477	9	6 50 40.35	2.2376	22 44 43.9	5.485
10	5 5 44.86	2.2108	24 44 57.8	0.356	10	6 52 54.59	2.2373	22 39 11.1	5.608
11	5 7 57.55	2.2122	24 45 15.5	0.234	11	6 55 8.80	2.2307	22 33 30.9	5.731
12	5 10 10.33	2.2138	24 45 25.9	0.113	12	6 57 22.99	2.2302	22 27 43.4	5.854
13	5 12 23.21	2.2154	24 45 29.0	0.010	13	6 59 37.15	2.2307	22 21 48.5	5.976
14	5 14 36.18	2.2169	24 45 24.7	0.133	14	7 1 51.27	2.2302	22 15 46.3	6.098
15	5 16 49.24	2.2184	24 45 13.1	0.255	15	7 4 5.36	2.2346	22 9 26.8	6.220
16	5 19 2.39	2.2198	24 44 54.1	0.378	16	7 6 19.42	2.2340	22 3 19.9	6.341
17	5 21 15.62	2.2212	24 44 27.7	0.501	17	7 8 33.44	2.2333	21 56 55.8	6.462
18	5 23 28.93	2.2226	24 43 54.0	0.624	18	7 10 47.42	2.2326	21 50 24.4	6.583
19	5 25 42.31	2.2237	24 43 12.8	0.748	19	7 13 1.36	2.2319	21 43 45.8	6.703
20	5 27 55.77	2.2249	24 42 24.2	0.871	20	7 15 15.25	2.2312	21 37 0.0	6.823
21	5 30 9.30	2.2261	24 41 28.2	0.995	21	7 17 29.10	2.2305	21 30 7.0	6.943
22	5 32 22.90	2.2273	24 40 24.7	1.119	22	7 19 42.91	2.2298	21 23 6.8	7.063
23	5 34 36.57	2.2288	N.24 39 13.8	1.243	23	7 21 56.67	2.2290	N.21 15 59.5	7.183
THURSDAY 26.					SATURDAY 28.				
0	5 36 50.30	2.2293	N.24 37 55.5	1.367	0	7 24 10.39	2.2282	N.21 8 45.0	7.301
1	5 39 4.09	2.2303	24 36 29.7	1.492	1	7 26 24.06	2.2273	21 1 23.4	7.419
2	5 41 17.94	2.2312	24 34 56.4	1.617	2	7 28 37.68	2.2266	20 53 54.7	7.537
3	5 43 31.84	2.2321	24 33 15.6	1.743	3	7 30 51.24	2.2258	20 46 19.0	7.654
4	5 45 45.79	2.2330	24 31 27.4	1.867	4	7 33 4.75	2.2248	20 38 36.2	7.771
5	5 47 59.79	2.2338	24 29 31.7	1.992	5	7 35 18.21	2.2239	20 30 46.4	7.888
6	5 50 13.84	2.2345	24 27 28.5	2.117	6	7 37 31.61	2.2230	20 22 49.6	8.004
7	5 52 27.93	2.2351	24 25 17.7	2.242	7	7 39 44.96	2.2221	20 14 45.9	8.120
8	5 54 42.05	2.2357	24 22 59.4	2.367	8	7 41 58.26	2.2212	20 6 35.2	8.236
9	5 56 56.21	2.2363	24 20 33.6	2.493	9	7 44 11.50	2.2203	19 58 17.6	8.351
10	5 59 10.41	2.2368	24 18 0.3	2.618	10	7 46 24.68	2.2193	19 49 53.1	8.466
11	6 1 24.64	2.2373	24 15 19.5	2.743	11	7 48 37.80	2.2183	19 41 21.8	8.579
12	6 3 38.89	2.2378	24 12 31.2	2.868	12	7 50 50.87	2.2174	19 32 43.7	8.693
13	6 5 53.17	2.2382	24 9 35.4	2.993	13	7 53 3.88	2.2164	19 23 58.8	8.806
14	6 8 7.48	2.2386	24 6 32.0	3.118	14	7 55 16.83	2.2154	19 15 7.1	8.917
15	6 10 21.81	2.2390	24 3 21.1	3.244	15	7 57 29.72	2.2144	19 6 8.7	9.029
16	6 12 36.15	2.2392	24 0 2.7	3.369	16	7 59 42.56	2.2134	18 57 3.7	9.140
17	6 14 50.51	2.2394	23 56 36.8	3.494	17	8 1 55.34	2.2124	18 47 52.0	9.251
18	6 17 4.88	2.2396	23 53 3.4	3.619	18	8 4 8.05	2.2114	18 38 33.6	9.361
19	6 19 19.27	2.2398	23 49 22.5	3.745	19	8 6 20.70	2.2104	18 29 8.7	9.470
20	6 21 33.66	2.2400	23 45 34.1	3.870	20	8 8 33.30	2.2094	18 19 37.2	9.579
21	6 23 48.06	2.2400	23 41 38.1	3.995	21	8 10 45.84	2.2085	18 9 59.2	9.687
22	6 26 2.46	2.2400	23 37 34.6	4.120	22	8 12 58.32	2.2076	18 0 14.8	9.794
23	6 28 16.87	2.2400	23 33 23.6	4.245	23	8 15 10.74	2.2066	17 50 23.9	9.901
24	6 30 31.27	2.2399	N.23 29 5.2	4.370	24	8 17 23.10	2.2056	N.17 40 26.6	10.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					MONDAY 30.				
0	^h 8 ^m 17 ^s 23.10	2.3065	N. 17° 40' 26.6"	10.007	0	^h 9 ^m 10 ^s 4.06	2.1865	N. 13° 11' 22.4"	13.336
1	8 19 35.40	2.3046	17 30 23.0	10.113	1	9 12 15.23	2.1860	12 58 59.5	13.424
2	8 21 47.65	2.3036	17 20 13.0	10.318	2	9 14 26.38	2.1855	12 46 31.5	13.510
3	8 23 59.84	2.3027	17 9 56.7	10.323	3	9 16 37.50	2.1851	12 33 58.3	13.596
4	8 26 11.97	2.3017	16 59 34.2	10.427	4	9 18 48.60	2.1847	12 21 20.1	13.679
5	8 28 24.04	2.3008	16 49 5.5	10.480	5	9 20 59.67	2.1843	12 8 36.9	13.763
6	8 30 36.06	2.1999	16 38 30.6	10.632	6	9 23 10.72	2.1840	11 55 48.7	13.844
7	8 32 48.03	2.1990	16 27 49.6	10.733	7	9 25 21.75	2.1837	11 42 55.7	13.926
8	8 34 59.94	2.1981	16 17 2.6	10.884	8	9 27 32.77	2.1834	11 29 57.8	14.006
9	8 37 11.80	2.1973	16 6 9.5	10.985	9	9 29 43.77	2.1832	11 16 55.2	14.083
10	8 39 23.60	2.1963	15 55 10.4	11.034	10	9 31 54.76	2.1830	11 3 47.9	14.160
11	8 41 35.35	2.1954	15 44 5.4	11.133	11	9 34 5.74	2.1829	10 50 36.0	14.237
12	8 43 47.05	2.1946	15 32 54.5	11.231	12	9 36 16.71	2.1828	10 37 19.5	14.313
13	8 45 58.70	2.1938	15 21 37.7	11.328	13	9 38 27.68	2.1827	10 23 58.5	14.387
14	8 48 10.31	2.1930	15 10 15.2	11.424	14	9 40 38.64	2.1827	10 10 33.1	14.460
15	8 50 21.87	2.1922	14 58 46.9	11.519	15	9 42 49.61	2.1826	9 57 3.3	14.532
16	8 52 33.39	2.1915	14 47 13.0	11.613	16	9 45 0.58	2.1826	9 43 29.3	14.603
17	8 54 44.86	2.1908	14 35 33.4	11.707	17	9 47 11.56	2.1826	9 29 51.0	14.673
18	8 56 56.29	2.1901	14 23 48.2	11.800	18	9 49 22.54	2.1831	9 16 8.5	14.742
19	8 59 7.68	2.1895	14 11 57.4	11.892	19	9 51 33.53	2.1833	9 2 22.0	14.809
20	9 1 19.03	2.1889	14 0 1.2	11.983	20	9 53 44.54	2.1836	8 48 31.4	14.875
21	9 3 30.34	2.1882	13 47 59.5	12.073	21	9 55 55.57	2.1839	8 34 36.8	14.941
22	9 5 41.61	2.1876	13 35 52.5	12.163	22	9 58 6.61	2.1843	8 20 38.4	14.006
23	9 7 52.85	2.1871	13 23 40.1	12.261	23	10 0 17.67	2.1846	8 6 36.1	14.069
24	9 10 4.06	2.1866	N. 13° 11' 22.4"	12.338	24	10 2 28.77	2.1851	N. 7° 52' 30.1"	14.131

PHASES OF THE MOON.

● New Moon,	d	h	m
☾ First Quarter,	4	10	12.9
○ Full Moon,	11	1	16.3
☾ Last Quarter,	18	14	1.8
	26	18	24.5

☾ Perigee,	d	h
☾ Apogee,	6	13.3
	22	8.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DIF.	III ^h .	P. L. of DIF.	VI ^h .	P. L. of DIF.	IX ^h .	P. L. of DIF.
1	α Arietis W.	79° 8' 50"	2668	80° 48' 9"	2665	82° 27' 52"	2648	84° 7' 50"	2680
	Aldebaran W.	46 46 1	2649	48 23 50	2627	50 2 8	2606	51 40 55	2585
	SUN E.	44 28 31	2619	42 56 36	2602	41 24 20	2586	39 51 43	2560
2	α Arietis W.	92 34 32	2448	94 17 2	2429	95 59 55	2414	97 43 10	2398
	Aldebaran W.	60 1 47	2467	61 43 18	2470	63 25 14	2451	65 7 36	2434
	Pollux W.	18 51 30	2779	20 26 26	2710	22 2 53	2663	23 40 36	2604
	SUN E.	32 3 30	2798	30 28 55	2781	28 54 2	2769	27 18 54	2750
6	SUN W.	22 13 59	2481	23 55 39	2470	25 37 34	2462	27 19 41	2455
	Antares E.	62 4 41	2168	60 13 47	2102	58 22 51	2102	56 31 55	2102
	α Aquilæ E.	113 36 53	2734	112 0 58	2716	110 24 40	2701	108 48 1	2688
7	SUN W.	35 52 7	2441	37 34 43	2442	39 17 18	2443	40 59 51	2445
	Antares E.	47 17 35	2111	45 26 53	2115	43 36 16	2119	41 45 46	2124
	α Aquilæ E.	100 41 14	2650	99 3 27	2648	97 25 37	2647	95 47 46	2648
8	SUN W.	49 31 22	2470	51 13 18	2476	52 55 5	2488	54 36 42	2490
	Spica W.	13 27 16	2241	15 14 43	2230	17 2 26	2223	18 50 19	2220
	Antares E.	32 35 18	2184	30 45 42	2163	28 56 18	2171	27 7 7	2180
	α Aquilæ E.	87 39 26	2674	86 2 10	2663	84 25 7	2663	82 48 18	2705
	Fomalhaut E.	112 56 59	2664	111 19 17	2648	109 41 27	2644	108 3 32	2643
9	SUN W.	63 2 0	2634	64 42 26	2644	66 22 38	2664	68 2 36	2684
	Venus W.	31 17 15	2607	32 54 39	2671	34 31 58	2676	36 9 11	2681
	Spica W.	27 49 38	2237	29 37 10	2245	31 24 31	2262	33 11 41	2283
	α Aquilæ E.	74 48 48	2788	73 14 2	2806	71 39 42	2828	70 5 51	2853
	Fomalhaut E.	99 53 55	2682	98 16 11	2666	96 38 35	2665	95 1 8	2672
	α Pegasi E.	121 18 17	2408	119 34 54	2410	117 51 34	2414	116 8 19	2418
10	SUN W.	76 18 47	2620	77 57 15	2631	79 35 28	2643	81 13 25	2658
	Venus W.	44 12 55	2723	45 49 5	2733	47 25 2	2742	49 0 46	2753
	Spica W.	42 4 19	2307	43 50 9	2317	45 35 44	2327	47 21 4	2337
	α Aquilæ E.	62 24 53	2807	60 54 37	2803	59 25 5	2871	57 56 20	2113
	Fomalhaut E.	86 56 48	2724	85 20 40	2788	83 44 50	2781	82 9 18	2766
	α Pegasi E.	107 33 59	2450	105 51 36	2459	104 9 25	2467	102 27 26	2477
11	SUN W.	89 19 7	2715	90 55 27	2728	92 31 30	2740	94 7 17	2753
	Venus W.	56 55 57	2807	58 30 16	2818	60 4 20	2830	61 38 9	2842
	Spica W.	56 3 53	2391	57 47 40	2403	59 31 11	2413	61 14 27	2424
	Fomalhaut E.	74 16 51	2893	72 43 31	2873	71 10 38	2894	69 38 12	2917
	α Pegasi E.	94 0 52	2827	92 20 16	2838	90 39 55	2849	88 59 50	2861
12	SUN W.	102 2 10	2813	103 36 21	2825	105 10 16	2838	106 43 55	2850
	Spica W.	69 46 49	2480	71 28 31	2490	73 9 58	2502	74 51 9	2513
	Venus W.	69 23 30	2900	70 55 49	2911	72 27 54	2923	73 59 44	2934
	Antares W.	24 7 51	2485	25 49 25	2494	27 30 46	2504	29 11 53	2514
	Fomalhaut E.	62 3 36	3047	60 34 22	3078	59 5 45	3110	57 37 48	3144
	α Pegasi E.	80 43 26	2621	79 5 0	2634	77 26 51	2646	75 48 59	2660
13	SUN W.	114 28 18	2909	116 0 25	2921	117 32 17	2933	119 3 54	2945
	Spica W.	83 13 22	2566	84 53 5	2576	86 32 33	2586	88 11 48	2596
	Venus W.	81 35 19	2991	83 5 43	3002	84 35 53	3014	86 5 49	3024
	Antares W.	37 34 0	2566	39 13 43	2574	40 53 13	2585	42 32 29	2595
	Fomalhaut E.	50 29 14	3244	49 6 5	3406	47 43 55	3402	46 22 48	3222

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	α Arietis W.	85° 48' 30"	2612	87° 29' 25"	2486	89° 10' 44"	2480	90° 52' 26"	2482
	Aldebaran W.	53 20 10	2606	54 59 53	2448	56 40 4	2826	58 20 42	2606
	Sun E.	38 18 45	2658	36 45 26	2636	35 11 47	2622	33 37 48	2606
2	α Arietis W.	99 26 48	2682	101 10 48	2606	102 55 11	2552	104 39 55	2337
	Aldebaran W.	66 50 22	2417	68 33 33	2400	70 17 8	2383	72 1 7	2367
	Pollux W.	25 19 25	2661	26 59 13	2623	28 39 54	2489	30 21 22	2456
	Sun E.	25 43 32	2760	24 7 58	2748	22 32 15	2740	20 56 28	2740
6	Sun W.	29 1 58	2446	30 44 24	2446	32 26 55	2442	34 9 30	2441
	Antares E.	54 40 59	2103	52 50 4	2104	50 59 11	2106	49 8 21	2109
	α Aquilæ E.	107 11 5	2677	105 33 54	2697	103 56 30	2690	102 18 56	2684
7	Sun W.	42 42 21	2449	44 24 46	2453	46 7 5	2456	47 49 17	2463
	Antares E.	39 55 23	2129	38 5 8	2136	36 15 2	2141	34 25 5	2147
	α Aquilæ E.	94 9 56	2660	92 32 9	2664	90 54 27	2656	89 16 52	2666
8	Sun W.	56 18 9	2496	57 59 25	2507	59 40 29	2515	61 21 21	2525
	Spica W.	20 38 17	2220	22 26 15	2222	24 14 10	2227	26 1 58	2232
	Antares E.	25 18 9	2190	23 29 26	2200	21 40 58	2211	19 52 47	2223
	α Aquilæ E.	81 11 45	2719	79 35 30	2728	77 59 34	2748	76 23 59	2767
	Fomalhaut E.	106 25 34	2642	104 47 36	2643	103 9 39	2645	101 31 45	2648
9	Sun W.	69 42 20	2676	71 21 49	2686	73 1 4	2697	74 40 3	2698
	Venus W.	37 46 16	2668	39 23 12	2666	40 59 57	2704	42 36 32	2713
	Spica W.	34 58 39	2660	36 45 24	2676	38 31 56	2687	40 18 15	2697
	α Aquilæ E.	68 32 30	2677	66 59 42	2684	65 27 28	2693	63 55 51	2694
	Fomalhaut E.	93 23 50	2661	91 46 44	2660	90 9 51	2701	88 33 12	2712
	α Pegasi E.	114 25 10	2424	112 42 9	2426	110 59 16	2426	109 16 32	2443
10	Sun W.	82 51 6	2666	84 28 31	2679	86 5 39	2691	87 42 31	2706
	Venus W.	50 36 17	2763	52 11 33	2776	53 46 35	2785	55 21 23	2796
	Spica W.	49 6 9	2246	50 50 58	2269	52 35 32	2270	54 19 50	2280
	α Aquilæ E.	56 28 26	2166	55 1 24	2203	53 35 18	2263	52 10 11	2307
	Fomalhaut E.	80 34 5	2782	78 59 13	2786	77 24 43	2816	75 50 35	2834
	α Pegasi E.	100 45 40	2466	99 4 7	2466	97 22 48	2506	95 41 43	2516
11	Sun W.	95 42 48	2764	97 18 3	2776	98 53 2	2789	100 27 44	2801
	Venus W.	63 11 43	2662	64 45 2	2665	66 18 6	2676	67 50 55	2687
	Spica W.	62 57 27	2486	64 40 11	2447	66 22 39	2466	68 4 52	2469
	Fomalhaut E.	68 6 15	2640	66 34 47	2666	65 3 50	2691	63 33 26	2618
	α Pegasi E.	87 20 1	2672	85 40 28	2684	84 1 11	2696	82 22 10	2698
12	Sun W.	108 17 18	2662	109 50 26	2673	111 23 19	2686	112 55 56	2696
	Spica W.	76 32 5	2628	78 12 46	2633	79 53 13	2644	81 33 25	2655
	Venus W.	75 31 20	2646	77 2 41	2667	78 33 48	2696	80 4 41	2690
	Antares W.	30 52 47	2625	32 33 26	2684	34 13 52	2645	35 54 3	2646
	Fomalhaut E.	56 10 32	2181	54 44 0	2230	53 18 14	2262	51 53 18	2306
	α Pegasi E.	74 11 25	2673	72 34 9	2687	70 57 12	2701	69 20 33	2715
13	Sun W.	120 35 16	2664	122 6 24	2666	123 37 17	2679	125 7 56	2691
	Spica W.	89 50 48	2606	91 29 35	2616	93 8 8	2626	94 46 27	2636
	Venus W.	87 35 32	2685	89 5 1	2646	90 34 17	2666	92 3 20	2668
	Antares W.	44 11 31	2604	45 50 20	2616	47 26 55	2624	49 7 17	2634
	Fomalhaut E.	45 2 48	2567	43 44 0	2669	42 26 29	2737	41 10 21	2623

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13	<i>a</i> Pegasi E.	67° 44' 13"	2739	66° 8' 12"	2745	64° 32' 32"	2760	62° 57' 11"	2775
	<i>a</i> Arietis E.	110 13 46	2661	108 34 25	2661	106 55 18	2661	105 16 24	2610
14	SUN W.	126 38 20	3002	128 8 30	3014	129 38 25	3026	131 8 5	3067
	Spica W.	96 24 33	2646	98 2 26	2658	99 40 5	2666	101 17 31	2675
	Venus W.	93 32 9	2678	95 0 45	2689	96 29 8	2699	97 57 19	2710
	Antares W.	50 45 26	2643	52 23 22	2653	54 1 5	2663	55 38 35	2673
	Fomalhaut E.	39 55 43	2619	38 42 43	2624	37 31 27	2631	36 22 5	2571
	<i>a</i> Pegasi E.	55 5 47	2662	53 32 39	2660	51 59 55	2661	50 27 37	2621
	<i>a</i> Arietis E.	97 5 15	2660	95 27 41	2660	93 50 19	2678	92 13 10	2638
15	Spica W.	109 21 34	2721	110 57 46	2730	112 33 46	2739	114 9 34	2748
	Venus W.	105 15 5	2161	106 42 1	2170	108 8 46	2180	109 35 19	2190
	Antares W.	63 43 0	2716	65 19 16	2726	66 55 21	2736	68 31 14	2744
	<i>a</i> Pegasi E.	42 53 16	2647	41 24 2	2678	39 55 26	2113	38 27 32	2148
	<i>a</i> Arietis E.	84 10 35	2734	82 34 40	2744	80 58 58	2753	79 23 28	2763
	Aldebaran E.	116 46 0	2770	115 10 53	2778	113 35 56	2786	112 1 10	2794
16	Venus W.	116 45 9	2226	118 10 33	2247	119 35 46	2256	121 0 47	2267
	Antares W.	76 27 49	2707	78 2 34	2720	79 37 9	2808	81 11 33	2811
	<i>a</i> Arietis E.	71 28 54	2606	69 54 34	2616	68 20 25	2624	66 46 28	2633
	Aldebaran E.	104 9 46	2631	102 35 59	2639	101 2 22	2647	99 28 55	2655
17	Antares W.	89 0 54	2692	90 34 15	2699	92 7 27	2667	93 40 26	2675
	<i>a</i> Aquilæ W.	42 52 4	4180	44 1 9	4093	45 11 17	4086	46 22 21	3984
	<i>a</i> Arietis E.	58 59 32	2676	57 26 42	2686	55 54 4	2694	54 21 37	2694
	Aldebaran E.	91 44 11	2694	90 11 44	2693	88 39 28	2699	87 7 21	2617
18	Antares W.	101 23 7	2613	102 55 11	2618	104 27 5	2626	105 58 51	2634
	<i>a</i> Aquilæ W.	52 29 2	2798	53 44 11	2707	54 59 48	2743	56 15 50	2721
	<i>a</i> Arietis E.	46 42 12	2647	45 10 53	2666	43 39 47	2666	42 8 52	2677
	Aldebaran E.	79 29 13	2666	77 58 5	2663	76 27 6	2671	74 56 17	2679
	Pollux E.	121 23 35	2692	119 52 34	2697	118 21 40	2673	116 50 53	2679
19	Antares W.	113 35 24	2698	115 6 17	2674	116 37 2	2661	118 7 39	2667
	<i>a</i> Aquilæ W.	62 41 3	2641	63 58 53	2631	65 16 54	2621	66 35 6	2613
	Fomalhaut W.	38 45 4	4244	39 52 49	4172	41 1 42	4107	42 11 37	4049
	<i>a</i> Arietis E.	34 37 27	2629	33 7 50	2640	31 38 27	2653	30 9 20	2667
	Aldebaran E.	67 24 39	2616	65 54 48	2626	64 25 6	2633	62 55 34	2641
	Pollux E.	109 18 50	2608	107 48 47	2614	106 18 51	2619	104 49 2	2626
20	<i>a</i> Aquilæ W.	73 7 59	2686	74 26 50	2693	75 45 44	2680	77 4 40	2677
	Fomalhaut W.	48 13 41	2637	49 28 5	2606	50 43 1	2777	51 58 27	2728
	Aldebaran E.	55 30 17	2678	54 1 41	2667	52 33 16	2696	51 5 1	2164
	Pollux E.	97 21 42	2663	95 52 34	2667	94 23 32	2663	92 54 37	2668
21	<i>a</i> Aquilæ W.	83 39 39	2677	84 58 38	2679	86 17 35	2660	87 36 31	2668
	Fomalhaut W.	58 21 26	2666	59 38 58	2648	60 56 46	2630	62 14 48	2618
	<i>a</i> Pegasi W.	35 54 45	2499	37 15 29	2407	38 36 41	2486	39 58 17	2416
	Aldebaran E.	43 46 15	2146	42 19 1	2156	40 51 58	2166	39 25 7	2175
	Pollux E.	85 31 27	2606	84 3 5	2606	82 34 49	2606	81 6 37	2101
	Regulus E.	122 27 54	2667	120 59 4	2670	119 30 18	2673	118 1 36	2677
22	<i>a</i> Aquilæ W.	94 10 27	2668	95 29 3	2669	96 47 35	2667	98 6 2	2612
	Fomalhaut W.	68 47 53	2671	70 6 59	2663	71 26 14	2656	72 45 36	2660

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13	α Pegasi E.	61° 22' 11"	2793	59° 47' 32"	2806	58° 13' 14"	2826	56° 39' 19"	2843
	α Arietis E.	103 37 43	2831	101 59 16	2830	100 21 2	2840	98 43 2	2860
14	SUN W.	132 37 32	2849	134 6 44	2860	135 35 42	2873	137° 4 25	2884
	Spica W.	102 54 45	2884	104 31 46	2884	106 8 34	2708	107 45 10	2712
	Venus W.	99 25 17	3130	100 53 2	3130	102 20 35	3140	103 47 56	3150
	Antares W.	57 15 53	2861	58 52 58	2860	60 29 51	2708	62 6 31	2708
	Fomalhaut E.	35 14 46	4418	34 9 41	4383	33 7 1	4789	32 6 59	4980
	α Pegasi E.	48 55 45	2844	47 24 22	2867	45 53 28	2892	44 23 5	2919
	α Arietis E.	90 36 14	2868	88 50 31	2707	87 23 0	2716	85 46 42	2726
15	Spica W.	115 45 10	2767	117 20 34	2766	118 55 46	2778	120 30 47	2784
	Venus W.	111 1 40	2809	112 27 49	2809	113 53 47	2819	115 19 34	2829
	Antares W.	70 6 56	2769	71 42 26	2761	73 17 45	2769	74 52 53	2779
	α Pegasi E.	37 0 21	3188	35 33 58	3228	34 8 27	3282	32 43 54	3287
	α Arietis E.	77 48 10	2771	76 13 4	2779	74 38 9	2788	73 3 26	2797
	Aldebaran E.	110 26 34	2801	108 52 7	2806	107 17 50	2816	105 43 43	2824
16	Venus W.	122 25 37	2776	123 50 16	2826	125 14 44	2834	126 39 2	2844
	Antares W.	82 45 46	2819	84 19 49	2828	85 53 41	2836	87 27 23	2844
	α Arietis E.	65 12 42	2849	63 39 8	2850	62 5 45	2859	60 32 33	2867
	Aldebaran E.	97 55 38	2882	96 22 31	2871	94 49 35	2878	93 16 48	2886
17	Antares W.	95 13 19	2883	96 46 0	2880	98 18 32	2896	99 50 54	2906
	α Aquilæ W.	47 34 16	2887	48 46 58	2896	50 0 22	2867	51 14 25	2824
	α Arietis E.	52 49 21	2912	51 17 17	2920	49 45 24	2929	48 13 42	2939
	Aldebaran E.	85 35 24	2926	84 3 37	2923	82 31 59	2940	81 0 31	2948
18	Antares W.	107 30 27	2941	109 1 54	2947	110 33 13	2954	112 4 23	2963
	α Aquilæ W.	57 32 15	2701	58 49 1	2683	60 6 6	2688	61 23 27	2684
	α Arietis E.	40 38 10	2986	39 7 40	2996	37 37 22	2907	36 7 18	2918
	Aldebaran E.	73 25 38	2987	71 55 9	2984	70 24 49	2902	68 54 39	2910
	Pollux E.	115 20 14	2986	113 49 42	2990	112 19 17	2997	110 49 0	2993
19	Antares W.	119 38 8	2998	121 8 29	2999	122 38 43	3006	124 8 49	3011
	α Aquilæ W.	67 53 27	2906	69 11 56	2909	70 30 31	2904	71 49 12	2908
	Fomalhaut W.	43 22 28	2997	44 34 11	2980	45 46 40	2908	46 59 52	2971
	α Arietis E.	28 40 30	2982	27 11 58	2987	25 43 45	2914	24 15 53	2923
	Aldebaran E.	61 26 12	2948	59 56 59	2956	58 27 56	2964	56 59 2	2971
	Pollux E.	103 19 20	2990	101 49 45	2996	100 20 17	2942	98 50 56	2947
20	α Aquilæ W.	78 23 39	2876	79 42 39	2876	81 1 39	2878	82 20 39	2876
	Fomalhaut W.	53 14 19	2730	54 30 34	2760	55 47 12	2880	57 4 10	2873
	Aldebaran E.	49 36 56	2912	48 9 1	2919	46 41 15	2929	45 13 40	2937
	Pollux E.	91 25 48	2972	89 57 4	2977	88 28 26	2892	86 59 54	2866
21	α Aquilæ W.	88 55 24	2886	90 14 15	2897	91 33 3	2891	92 51 47	2896
	Fomalhaut W.	63 33 3	2807	64 51 30	2807	66 10 8	2807	67 28 56	2879
	α Pegasi W.	41 20 15	2899	42 42 33	2883	44 5 9	2870	45 28 0	2857
	Aldebaran E.	37 58 28	2986	36 32 2	2996	35 5 50	2909	33 39 52	2924
	Pollux E.	79 38 29	2906	78 10 25	2906	76 42 25	2911	75 14 29	2914
	Regulus E.	116 32 58	2979	115 4 23	2983	113 35 51	2884	112 7 22	2886
22	α Aquilæ W.	99 24 23	2817	100 42 39	2828	102 0 48	2829	103 18 51	2836
	Fomalhaut W.	74 5 5	2844	75 24 41	2838	76 44 23	2833	78 4 11	2828

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22	α Pegasi W.	46° 51' 6"	3345	48° 14' 25"	3336	49° 37' 56"	3328	51° 1' 39"	3316
	Aldebaran E.	32 14 11	3238	30 48 47	3255	29 23 43	3273	27 59 0	3294
	Pollux E.	73 46 37	3117	72 18 48	3119	70 51 2	3121	69 23 18	3124
	Regulus E.	110 38 55	3057	109 10 30	3059	107 42 7	3059	106 13 45	3051
23	α Aquilæ W.	104 36 47	3043	105 54 36	3049	107 12 17	3058	108 29 49	3065
	Fomalhaut W.	79 24 4	3023	80 44 3	3018	82 4 7	3014	83 24 16	3008
	α Pegasi W.	58 2 39	3277	59 27 17	3270	60 52 4	3263	62 16 59	3257
	Pollux E.	62 5 10	3129	60 37 36	3130	59 10 3	3130	57 42 30	3131
	Regulus E.	98 52 4	3091	97 23 43	3090	95 55 21	3089	94 26 58	3087
	SUN E.	131 18 53	3485	129 58 12	3482	128 37 28	3480	127 16 41	3477
24	Fomalhaut W.	90 6 8	3490	91 26 43	3487	92 47 22	3484	94 8 4	3480
	α Pegasi W.	69 23 29	3223	70 49 11	3216	72 15 2	3208	73 41 1	3201
	α Arietis W.	25 48 35	3160	27 15 32	3147	28 42 45	3134	30 10 13	3123
	Pollux E.	50 24 45	3129	48 57 10	3137	47 29 33	3136	46 1 55	3125
	Regulus E.	87 4 17	3073	85 35 33	3069	84 6 45	3064	82 37 51	3060
	SUN E.	120 31 55	3458	119 10 44	3454	117 49 28	3447	116 28 5	3442
25	Fomalhaut W.	100 52 28	3495	102 13 30	3493	103 34 35	3493	104 55 42	3490
	α Pegasi W.	80 53 11	3163	82 20 6	3163	83 47 11	3148	85 14 26	3135
	α Arietis W.	37 31 0	3067	38 59 50	3066	40 28 53	3049	41 58 9	3035
	Pollux E.	38 43 27	3121	37 15 43	3131	35 47 59	3129	34 20 16	3123
	Regulus E.	75 11 43	3099	73 42 6	3092	72 12 20	3014	70 42 24	3085
	SUN E.	109 39 26	3407	108 17 17	3399	106 54 59	3389	105 32 30	3380
26	Fomalhaut W.	111 41 41	3496	113 2 54	3497	114 24 6	3498	115 45 17	3491
	α Pegasi W.	92 33 35	3087	94 2 1	3076	95 30 40	3068	96 59 32	3054
	α Arietis W.	49 27 58	3277	50 58 40	3286	52 29 37	3261	54 0 51	3250
	Aldebaran W.	18 9 20	3408	19 31 33	3337	20 55 13	3304	22 20 7	3310
	Pollux E.	27 2 32	3160	25 35 23	3164	24 8 31	3163	22 42 1	3207
	Regulus E.	63 10 3	3098	61 38 58	3048	60 7 40	3237	58 36 8	3226
	SUN E.	98 37 18	3427	97 13 38	3414	95 49 43	3393	94 25 34	3380
27	α Pegasi W.	104 27 19	3297	105 57 36	3265	107 28 7	3278	108 58 54	3282
	α Arietis W.	61 41 15	3099	63 14 14	3043	64 47 33	3038	66 21 11	3033
	Aldebaran W.	29 38 18	3019	31 8 7	3260	32 38 33	3262	34 9 34	3265
	Regulus E.	50 54 44	3063	49 21 38	3061	47 48 16	3037	46 14 36	3023
	SUN E.	87 20 52	3318	85 55 4	3303	84 28 58	3188	83 2 34	3171
28	α Arietis W.	74 14 33	3741	75 50 19	3733	77 26 28	3706	79 3 0	3698
	Aldebaran W.	41 52 38	3216	43 26 46	3793	45 1 23	3771	46 36 29	3740
	Regulus E.	38 21 41	3761	36 46 9	3787	35 10 18	3723	33 34 9	3710
	SUN E.	75 45 32	3086	74 17 4	3097	72 48 14	3049	71 19 2	3030
29	α Arietis W.	87 11 42	3597	88 50 41	3579	90 30 5	3560	92 9 55	3542
	Aldebaran W.	54 39 10	3042	56 17 8	3031	57 55 35	3000	59 34 30	2980
	Regulus E.	25 28 52	3046	23 51 0	3036	22 12 56	3022	20 34 44	2998
	SUN E.	63 47 11	2985	62 15 37	2916	60 43 38	2906	59 11 14	2876
30	α Arietis W.	100 35 33	2448	102 17 59	2429	104 0 52	2412	105 44 10	2394
	Aldebaran W.	67 56 9	2477	69 37 54	2468	71 20 7	2438	73 2 47	2419
	Pollux W.	26 27 15	3023	28 5 40	3062	29 45 0	3046	31 25 9	3012
	SUN E.	51 23 0	2781	49 48 7	2761	48 12 48	2743	46 37 5	2726

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22	α Pegasi W.	52° 25' 32"	3307	53° 49' 35"	3300	55° 13' 47"	3291	56° 38' 9"	3284
	Aldebaran E.	26 34 42	3319	25 10 52	3346	23 47 34	3380	22 24 55	3420
	Pollux E.	67 55 37	3126	66 27 58	3137	65 0 21	3126	63 32 45	3129
	Regulus E.	104 45 24	3091	103 17 4	3091	101 48 44	3091	100 20 24	3091
23	α Aquilæ W.	109 47 13	3075	111 4 27	3084	112 21 31	3096	113 38 23	3706
	Fomalhaut W.	84 44 30	3006	86 4 48	3002	87 25 10	3497	88 45 37	3494
	α Pegasi W.	63 42 1	3260	65 7 11	3243	66 32 29	3236	67 57 55	3230
	Pollux E.	56 14 58	3130	54 47 25	3130	53 19 52	3130	51 52 19	3129
	Regulus E.	92 58 32	3084	91 30 3	3083	90 1 31	3079	88 32 56	3076
	SUN E.	125 55 51	3474	124 34 58	3471	123 14 2	3467	121 53 1	3463
24	Fomalhaut W.	95 28 50	3477	96 49 40	3474	98 10 33	3471	99 31 29	3469
	α Pegasi W.	75 7 9	3193	76 33 26	3187	77 59 51	3178	79 26 26	3170
	α Arietis W.	31 37 55	3111	33 5 51	3100	34 34 1	3089	36 2 24	3078
	Pollux E.	44 34 16	3124	43 6 36	3123	41 38 54	3122	40 11 11	3121
	Regulus E.	81 8 51	3054	79 39 45	3048	78 10 32	3043	76 41 11	3036
	SUN E.	115 6 36	3496	113 45 0	3490	112 23 17	3423	111 1 26	3416
25	Fomalhaut W.	106 16 51	3468	107 38 2	3467	108 59 14	3456	110 20 27	3446
	α Pegasi W.	86 41 53	3196	88 9 31	3117	89 37 20	3107	91 5 21	3096
	α Arietis W.	43 27 38	3024	44 57 21	3013	46 27 19	3001	47 57 31	2989
	Pollux E.	32 52 34	3126	31 24 55	3129	29 57 21	3133	28 29 52	3141
	Regulus E.	69 12 18	3097	67 42 2	3066	66 11 34	3079	64 40 55	3069
	SUN E.	104 9 51	3371	102 47 1	3360	101 23 59	3350	100 0 45	3338
26	Fomalhaut W.	117 6 25	3463	118 27 30	3466	119 48 30	3473	121 9 24	3480
	α Pegasi W.	98 28 38	3043	99 57 57	3032	101 27 30	3021	102 57 17	3009
	α Arietis W.	55 32 21	3036	57 4 8	2991	58 36 13	2998	60 8 35	2983
	Aldebaran W.	23 46 4	3163	25 12 57	3123	26 40 40	3068	28 9 8	3061
	Pollux E.	21 16 0	3236	19 50 36	3280	18 26 1	3338	17 2 34	3414
	Regulus E.	57 4 22	2914	55 32 21	2901	54 0 4	2900	52 27 32	2877
	SUN E.	93 1 10	3370	91 36 30	3362	90 11 34	3348	88 46 22	3333
27	α Pegasi W.	110 29 55	2960	112 1 11	2937	113 32 43	2926	115 4 29	2913
	α Arietis W.	67 55 9	2807	69 29 28	2791	71 4 8	2775	72 39 10	2758
	Aldebaran W.	35 41 8	2910	37 13 14	2886	38 45 52	2862	40 19 0	2838
	Regulus E.	44 40 38	2809	43 6 22	2796	41 31 47	2780	39 56 53	2766
	SUN E.	81 35 50	3184	80 8 46	3138	78 41 22	3121	77 13 38	3103
28	α Arietis W.	80 39 56	2670	82 17 16	2662	83 55 0	2634	85 33 9	2616
	Aldebaran W.	48 12 4	2737	49 48 8	2706	51 24 40	2684	53 1 41	2663
	Regulus E.	31 57 42	2695	30 20 56	2682	28 43 52	2669	27 6 30	2657
	SUN E.	69 49 27	3012	68 19 29	2993	66 49 7	2973	65 18 21	2954
29	α Arietis W.	93 50 10	2623	95 30 51	2604	97 11 59	2498	98 53 33	2487
	Aldebaran W.	61 13 53	2569	62 53 45	2638	64 34 5	2616	66 14 53	2496
	Regulus E.	18 56 27	2639	17 18 11	2636	15 40 5	2644	14 2 23	2696
	SUN E.	57 38 25	2667	56 5 11	2636	54 31 32	2616	52 57 28	2600
30	α Arietis W.	107 27 54	2375	109 12 4	2367	110 56 40	2339	112 41 42	2323
	Aldebaran W.	74 45 55	2400	76 29 30	2381	78 13 32	2362	79 58 2	2343
	Pollux W.	33 6 4	2482	34 47 42	2463	36 30 1	2426	38 13 0	2399
	SUN E.	45 0 58	2797	43 24 27	2689	41 47 33	2672	40 10 16	2656

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semidiameter.			
		^h ^m ^s	^s	[°] ['] ["]	["]	['] ["]	^s	^m ^s	^s
Tues.	1	12 30 23.00	9.066	S. 3 16 58.6	58.31	16 1.62	64.38	10 23.74	0.791
Wed.	2	12 34 0.70	9.079	3 40 16.6	58.22	16 1.90	64.42	10 42.55	0.777
Thur.	3	12 37 38.73	9.093	4 3 32.1	58.10	16 2.17	64.47	11 1.03	0.763
Fri.	4	12 41 17.09	9.108	4 26 44.7	57.97	16 2.45	64.52	11 19.17	0.749
Sat.	5	12 44 55.80	9.123	4 49 54.0	57.82	16 2.73	64.57	11 36.96	0.734
Sun.	6	12 48 34.89	9.139	5 12 59.7	57.66	16 3.01	64.63	11 54.37	0.718
Mon.	7	12 52 14.37	9.155	5 36 1.4	57.49	16 3.29	64.69	12 11.39	0.701
Tues.	8	12 55 54.26	9.172	5 59 58.8	57.29	16 3.58	64.76	12 28.02	0.683
Wed.	9	12 59 34.57	9.190	6 21 51.4	57.09	16 3.86	64.83	12 44.21	0.665
Thur.	10	13 3 15.33	9.209	6 44 38.8	56.87	16 4.14	64.90	12 59.96	0.647
Fri.	11	13 6 56.54	9.228	7 7 20.6	56.63	16 4.42	64.97	13 15.27	0.628
Sat.	12	13 10 38.22	9.248	7 29 56.4	56.36	16 4.70	65.04	13 30.10	0.608
Sun.	13	13 14 20.39	9.270	7 52 26.0	56.09	16 4.98	65.12	13 44.44	0.587
Mon.	14	13 18 3.08	9.292	8 14 49.0	55.81	16 5.26	65.20	13 58.27	0.566
Tues.	15	13 21 46.31	9.314	8 37 5.0	55.52	16 5.54	65.28	14 11.55	0.544
Wed.	16	13 25 30.08	9.337	8 59 13.6	55.20	16 5.82	65.36	14 24.30	0.520
Thur.	17	13 29 14.42	9.361	9 21 14.6	54.88	16 6.10	65.45	14 36.49	0.496
Fri.	18	13 32 59.35	9.386	9 43 7.5	54.53	16 6.37	65.54	14 48.07	0.470
Sat.	19	13 36 44.89	9.413	10 4 51.9	54.17	16 6.64	65.63	14 59.04	0.444
Sun.	20	13 40 31.08	9.439	10 26 27.5	53.79	16 6.91	65.72	15 9.39	0.417
Mon.	21	13 44 17.92	9.467	10 47 53.9	53.40	16 7.18	65.81	15 19.08	0.389
Tues.	22	13 48 5.43	9.495	11 9 10.7	52.99	16 7.45	65.91	15 28.11	0.361
Wed.	23	13 51 53.64	9.525	11 30 17.6	52.57	16 7.71	66.01	15 36.42	0.333
Thur.	24	13 55 42.57	9.556	11 51 14.1	52.13	16 7.96	66.11	15 44.01	0.303
Fri.	25	13 59 32.23	9.586	12 11 59.9	51.67	16 8.21	66.21	15 50.89	0.273
Sat.	26	14 3 22.63	9.616	12 32 34.5	51.20	16 8.46	66.33	15 57.05	0.242
Sun.	27	14 7 13.76	9.647	12 52 57.6	50.71	16 8.71	66.43	16 2.46	0.209
Mon.	28	14 11 5.65	9.680	13 13 8.7	50.20	16 8.97	66.54	16 7.10	0.176
Tues.	29	14 14 58.34	9.713	13 33 7.4	49.67	16 9.22	66.65	16 10.96	0.143
Wed.	30	14 18 51.83	9.746	13 52 53.3	49.13	16 9.47	66.76	16 14.01	0.110
Thur.	31	14 22 46.12	9.780	14 12 25.9	48.56	16 9.72	66.87	16 16.28	0.077
Fri.	32	14 26 41.22	9.814	S. 14 31 44.8	47.99	16 9.96	66.98	16 17.73	0.043

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Tues.	1	12 ^h 30 ^m 24.57 ^s	9.066	S. 3° 17' 8.7"	58.31	10 23.88	0.791	12 40 48.45
Wed.	2	12 34 2.32	9.079	3 40 27.0	58.22	10 42.69	0.777	12 44 45.01
Thur.	3	12 37 40.39	9.093	4 3 42.8	58.10	11 1.17	0.763	12 48 41.56
Fri.	4	12 41 18.80	9.108	4 26 55.7	57.97	11 19.31	0.749	12 52 38.11
Sat.	5	12 44 57.57	9.123	4 50 5.3	57.82	11 37.10	0.734	12 56 34.67
Sun.	6	12 48 36.71	9.139	5 13 11.2	57.66	11 54.51	0.718	13 0 31.22
Mon.	7	12 52 16.24	9.155	5 36 13.1	57.49	12 11.53	0.701	13 4 27.77
Tues.	8	12 55 56.17	9.172	5 59 10.7	57.29	12 28.16	0.683	13 8 24.33
Wed.	9	12 59 36.53	9.190	6 22 3.5	57.09	12 44.35	0.665	13 12 20.88
Thur.	10	13 3 17.33	9.209	6 44 51.1	56.87	13 0.10	0.647	13 16 17.43
Fri.	11	13 6 58.58	9.228	7 7 33.1	56.63	13 15.41	0.628	13 20 13.99
Sat.	12	13 10 40.30	9.248	7 30 9.1	56.36	13 30.24	0.608	13 24 10.54
Sun.	13	13 14 22.51	9.270	7 52 38.9	56.09	13 44.58	0.587	13 28 7.09
Mon.	14	13 18 5.24	9.292	8 15 2.1	55.81	13 58.41	0.566	13 32 3.65
Tues.	15	13 21 48.51	9.314	8 37 18.2	55.52	14 11.69	0.544	13 36 0.20
Wed.	16	13 25 32.32	9.337	8 59 26.9	55.20	14 24.43	0.520	13 39 56.75
Thur.	17	13 29 16.70	9.361	9 21 28.0	54.88	14 36.61	0.495	13 43 53.31
Fri.	18	13 33 1.67	9.386	9 43 21.0	54.53	14 48.19	0.470	13 47 49.86
Sat.	19	13 36 47.25	9.413	10 5 5.5	54.17	14 59.16	0.444	13 51 46.41
Sun.	20	13 40 33.47	9.439	10 26 41.2	53.79	15 9.50	0.417	13 55 42.97
Mon.	21	13 44 20.34	9.467	10 48 7.6	53.40	15 19.18	0.389	13 59 39.52
Tues.	22	13 48 7.88	9.495	11 9 24.4	52.99	15 28.20	0.361	14 3 36.08
Wed.	23	13 51 56.12	9.525	11 30 31.3	52.57	15 36.51	0.332	14 7 32.63
Thur.	24	13 55 45.08	9.556	11 51 27.8	52.13	15 44.10	0.303	14 11 29.18
Fri.	25	13 59 34.77	9.586	12 12 13.6	51.67	15 50.97	0.273	14 15 25.74
Sat.	26	14 3 25.19	9.616	12 32 48.2	51.20	15 57.10	0.242	14 19 22.29
Sun.	27	14 7 16.33	9.647	12 53 11.2	50.71	16 2.52	0.209	14 23 18.85
Mon.	28	14 11 8.25	9.680	13 13 22.2	50.20	16 7.15	0.176	14 27 15.40
Tues.	29	14 15 0.96	9.713	13 33 20.8	49.67	16 11.00	0.143	14 31 11.96
Wed.	30	14 18 54.47	9.746	13 53 6.6	49.13	16 14.04	0.110	14 35 8.51
Thur.	31	14 22 48.77	9.780	14 12 39.1	48.56	16 16.30	0.077	14 39 5.07
Fri.	32	14 26 43.88	9.814	S. 14 31 57.8	47.99	16 17.74	0.043	14 43 1.62

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
		True LONGITUDE.		Dist. for 1 hour.	LATITUDE.				
		λ	λ'						
1	274	188° 17' 1.4"	16 7.1	147.77	—0.45	0.0001685	51.5	11 17 20.28	
2	275	189 16 8.9	15 14.5	147.86	0.51	0.0000446	51.8	11 13 24.37	
3	276	190 15 18.5	14 24.0	147.95	0.54	9.9999201	52.0	11 9 28.46	
4	277	191 14 30.2	13 35.6	148.03	0.53	.9997949	52.3	11 5 32.55	
5	278	192 13 44.0	12 49.3	148.11	0.50	.9996692	52.5	11 1 36.65	
6	279	193 12 59.8	12 5.0	148.19	0.44	.9995430	52.7	10 57 40.75	
7	280	194 12 17.4	11 22.5	148.27	0.36	.9994164	52.9	10 53 44.84	
8	281	195 11 36.9	10 41.9	148.34	0.26	.9992894	53.0	10 49 48.92	
9	282	196 10 58.3	10 3.2	148.41	0.14	.9991621	53.0	10 45 53.02	
10	283	197 10 21.4	9 26.2	148.48	—0.02	.9990347	53.0	10 41 57.11	
11	284	198 9 46.3	8 51.0	148.56	+0.11	.9989074	52.9	10 38 1.21	
12	285	199 9 12.9	8 17.5	148.64	0.24	.9987802	52.9	10 34 5.30	
13	286	200 8 41.2	7 45.7	148.72	0.34	.9986535	52.7	10 30 9.39	
14	287	201 8 11.3	7 15.7	148.80	0.43	.9985273	52.4	10 26 13.48	
15	288	202 7 43.3	6 47.6	148.88	0.50	.9984019	52.0	10 22 17.57	
16	289	203 7 17.2	6 21.4	148.96	0.53	.9982773	51.7	10 18 21.67	
17	290	204 6 52.9	5 57.0	149.04	0.53	.9981537	51.3	10 14 25.76	
18	291	205 6 30.6	5 34.6	149.12	0.50	.9980312	50.8	10 10 29.85	
19	292	206 6 10.1	5 14.1	149.20	0.46	.9979096	50.3	10 6 33.94	
20	293	207 5 51.6	4 55.5	149.28	0.38	.9977894	49.8	10 2 38.03	
21	294	208 5 35.2	4 38.9	149.36	0.27	.9976703	49.3	9 58 42.13	
22	295	209 5 21.0	4 24.5	149.45	0.14	.9975524	48.9	9 54 46.22	
23	296	210 5 8.9	4 12.3	149.54	+0.01	.9974356	48.4	9 50 50.31	
24	297	211 4 59.0	4 2.3	149.63	—0.14	.9973199	48.0	9 46 54.40	
25	298	212 4 51.3	3 54.5	149.72	0.28	.9972051	47.7	9 42 58.49	
26	299	213 4 45.9	3 49.0	149.81	0.41	.9970911	47.3	9 39 2.59	
27	300	214 4 42.7	3 45.6	149.91	0.52	.9969778	47.0	9 35 6.68	
28	301	215 4 41.7	3 44.5	150.00	0.62	.9968655	46.6	9 31 10.77	
29	302	216 4 42.8	3 45.5	150.09	0.68	.9967538	46.4	9 27 14.86	
30	303	217 4 46.1	3 48.7	150.18	0.72	.9966426	46.2	9 23 18.95	
31	304	218 4 51.4	3 53.9	150.27	0.73	.9965319	46.0	9 19 23.05	
32	305	219 4 58.7	4 1.0	150.35	—0.70	9.9964217	45.8	9 15 27.14	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI-DIAMETER.

HORIZONTAL PARALLAX.

MERIDIAN PASSAGE.

AGE.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	16' 9.4	16 16.6	59' 11.3	+2.26	59 37.6	+2.11	22 ^h 6.6 ^m	2.12	26.6 ^d
2	16 23.1	16 28.9	60 1.7	1.90	60 23.0	1.64	22 58.0	2.18	27.6
3	16 33.8	16 37.6	60 40.8	1.33	60 54.7	0.97	23 51.5	2.28	28.6
4	16 40.1	16 41.4	61 4.1	+0.60	61 8.9	+0.20	δ		0.2
5	16 41.5	16 40.2	61 9.0	-0.19	61 4.4	-0.57	0 47.8	2.41	1.2
6	16 37.8	16 34.2	60 55.4	0.93	60 42.3	1.24	1 47.0	2.52	2.2
7	16 29.7	16 24.4	60 25.7	1.51	60 6.2	1.73	2 48.5	2.59	3.2
8	16 18.4	16 12.0	59 44.4	1.89	59 20.9	2.01	3 50.6	2.57	4.2
9	16 5.4	15 58.6	58 56.4	2.07	58 31.4	2.09	4 51.1	2.46	5.2
10	15 51.8	15 45.1	58 6.4	2.66	57 42.0	2.01	5 48.2	2.30	6.2
11	15 38.7	15 32.5	57 18.3	1.93	56 55.6	1.84	6 41.3	2.12	7.2
12	15 26.6	15 21.2	56 34.2	1.73	56 14.1	1.62	7 30.3	1.97	8.2
13	15 16.1	15 11.4	55 55.4	1.50	55 38.2	1.38	8 15.9	1.84	9.2
14	15 7.1	15 3.2	55 22.4	1.26	55 8.0	1.14	8 59.1	1.76	10.2
15	14 59.7	14 56.5	54 55.1	1.02	54 43.6	0.90	9 41.0	1.73	11.2
16	14 53.7	14 51.3	54 33.4	0.79	54 24.5	0.69	10 22.3	1.73	12.2
17	14 49.3	14 47.5	54 16.9	0.58	54 10.5	0.48	11 4.1	1.76	13.2
18	14 46.1	14 45.1	54 5.8	0.38	54 1.4	0.27	11 47.0	1.82	14.2
19	14 44.3	14 44.0	53 58.8	-0.17	53 57.4	-0.06	12 31.6	1.90	15.2
20	14 44.0	14 44.4	53 57.4	+0.06	53 58.9	+0.19	13 18.1	1.98	16.2
21	14 45.2	14 46.4	54 1.9	0.32	54 6.4	0.45	14 6.5	2.05	17.2
22	14 48.1	14 50.4	54 12.8	0.60	54 20.9	0.76	14 56.3	2.10	18.2
23	14 53.1	14 56.4	54 31.0	0.92	54 43.1	1.09	15 46.9	2.11	19.2
24	15 0.3	15 4.7	54 57.3	1.27	55 13.6	1.44	16 37.4	2.10	20.2
25	15 9.7	15 15.3	55 31.9	1.62	55 52.3	1.78	17 27.3	2.06	21.2
26	15 21.4	15 28.0	56 14.7	1.94	56 39.0	2.09	18 16.4	2.03	22.2
27	15 35.0	15 42.4	57 4.8	2.22	57 32.1	2.32	19 4.9	2.02	23.2
28	15 50.1	15 57.9	58 0.3	2.38	58 29.1	2.41	19 53.4	2.03	24.2
29	16 5.8	16 13.4	58 57.9	2.38	59 26.0	2.30	20 42.9	2.09	25.2
30	16 20.8	16 27.5	59 52.9	2.16	60 17.7	1.96	21 34.3	2.20	26.2
31	16 33.5	16 38.5	60 39.6	1.69	60 58.1	1.38	22 28.7	2.34	27.2
32	16 42.4	16 45.1	61 12.5	+1.01	61 22.2	+0.61	23 26.9	2.50	28.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	10 2 28.77	2.1851	N. 7° 52' 30.1"	14.181	0	11 48 54.82	2.3730	S. 4° 10' 25.7"	14.306
1	10 4 39.89	2.1856	7 38 20.4	14.191	1	11 51 11.24	2.3762	4 25 49.0	14.361
2	10 6 51.04	2.1861	7 24 7.2	14.200	2	11 53 27.85	2.3768	4 41 11.4	14.365
3	10 9 2.23	2.1867	7 9 50.4	14.208	3	11 55 44.66	2.3819	4 56 32.8	14.347
4	10 11 13.45	2.1874	6 55 30.2	14.263	4	11 58 1.68	2.3863	5 11 53.1	14.327
5	10 13 24.71	2.1881	6 41 6.6	14.420	5	12 0 18.91	2.3898	5 27 12.1	14.306
6	10 15 36.02	2.1886	6 26 39.8	14.474	6	12 2 36.34	2.3923	5 42 29.8	14.282
7	10 17 47.37	2.1896	6 12 9.8	14.527	7	12 4 53.99	2.3969	5 57 46.0	14.257
8	10 19 58.77	2.1904	5 57 36.6	14.579	8	12 7 11.85	2.3996	6 13 0.6	14.229
9	10 22 10.22	2.1913	5 43 0.3	14.632	9	12 9 29.93	2.4022	6 28 13.5	14.200
10	10 24 21.73	2.1923	5 28 21.1	14.678	10	12 11 48.23	2.4068	6 43 24.6	14.169
11	10 26 33.30	2.1933	5 13 39.0	14.726	11	12 14 6.76	2.4107	6 58 33.8	14.136
12	10 28 44.93	2.1944	4 58 54.1	14.771	12	12 16 25.51	2.4148	7 13 40.9	14.101
13	10 30 56.63	2.1955	4 44 6.5	14.816	13	12 18 44.49	2.4183	7 28 45.9	14.064
14	10 33 8.39	2.1968	4 29 16.2	14.859	14	12 21 3.71	2.4223	7 43 48.6	14.025
15	10 35 20.22	2.1978	4 14 23.4	14.900	15	12 23 23.17	2.4262	7 58 48.9	14.004
16	10 37 32.13	2.1991	3 59 28.2	14.940	16	12 25 42.86	2.4303	8 13 46.7	14.041
17	10 39 44.12	2.2006	3 44 30.6	14.979	17	12 28 2.80	2.4343	8 28 41.9	14.097
18	10 41 56.19	2.2019	3 29 30.7	15.016	18	12 30 22.98	2.4384	8 43 34.3	14.051
19	10 44 8.35	2.2034	3 14 28.6	15.052	19	12 32 43.41	2.4426	8 58 23.9	14.009
20	10 46 20.60	2.2050	2 59 24.4	15.087	20	12 35 4.09	2.4468	9 13 10.5	14.051
21	10 48 32.95	2.2066	2 44 18.2	15.120	21	12 37 25.02	2.4510	9 27 54.0	14.086
22	10 50 45.39	2.2082	2 29 10.0	15.152	22	12 39 46.21	2.4552	9 42 34.3	14.043
23	10 52 57.93	2.2099	N. 2 14 0.0	15.183	23	12 42 7.65	2.4596	S. 9 57 11.3	14.097
WEDNESDAY 2.					FRIDAY 4.				
0	10 55 10.58	2.2117	N. 1 58 48.2	15.210	0	12 44 29.35	2.4638	S. 10 11 44.8	14.089
1	10 57 23.34	2.2136	1 43 34.8	15.237	1	12 46 51.31	2.4683	10 26 14.7	14.066
2	10 59 36.21	2.2155	1 28 19.8	15.262	2	12 49 13.54	2.4727	10 40 41.0	14.066
3	11 1 49.20	2.2175	1 13 3.4	15.286	3	12 51 36.04	2.4773	10 55 3.4	14.041
4	11 4 2.31	2.2196	0 57 45.6	15.307	4	12 53 58.80	2.4816	11 9 21.9	14.073
5	11 6 15.54	2.2216	0 42 26.5	15.327	5	12 56 21.83	2.4861	11 23 36.3	14.066
6	11 8 28.90	2.2237	0 27 6.3	15.346	6	12 58 45.13	2.4906	11 37 46.6	14.135
7	11 10 42.38	2.2258	N. 0 11 44.9	15.364	7	13 1 8.70	2.4952	11 51 52.6	14.068
8	11 12 56.00	2.2281	S. 0 3 37.4	15.379	8	13 3 32.55	2.4998	12 5 54.2	14.060
9	11 15 9.76	2.2304	0 19 0.6	15.393	9	13 5 56.68	2.4044	12 19 51.3	14.013
10	11 17 23.65	2.2328	0 34 24.6	15.406	10	13 8 21.08	2.4090	12 33 43.8	14.024
11	11 19 37.69	2.2349	0 49 49.3	15.417	11	13 10 45.76	2.4137	12 47 31.5	14.074
12	11 21 51.87	2.2377	1 5 14.6	15.426	12	13 13 10.72	2.4183	13 1 14.3	14.073
13	11 24 6.20	2.2403	1 20 40.4	15.433	13	13 15 35.96	2.4230	13 14 52.2	14.060
14	11 26 20.69	2.2426	1 36 6.5	15.438	14	13 18 1.48	2.4276	13 28 24.9	14.061
15	11 28 35.33	2.2444	1 51 32.9	15.442	15	13 20 27.38	2.4323	13 41 52.4	14.013
16	11 30 50.14	2.2461	2 6 59.5	15.444	16	13 22 53.96	2.4370	13 55 14.5	14.023
17	11 33 5.11	2.2480	2 22 26.2	15.444	17	13 25 19.72	2.4417	14 8 31.1	14.061
18	11 35 20.25	2.2498	2 37 52.8	15.442	18	13 27 46.37	2.4464	14 21 42.2	14.106
19	11 37 35.56	2.2517	2 53 19.3	15.439	19	13 30 13.30	2.4512	14 34 47.6	14.043
20	11 39 51.05	2.2536	3 8 45.5	15.434	20	13 32 40.51	2.4560	14 47 47.2	14.043
21	11 42 6.71	2.2556	3 24 11.4	15.427	21	13 35 8.01	2.4607	15 0 40.8	14.043
22	11 44 22.56	2.2577	3 39 36.8	15.418	22	13 37 35.79	2.4654	15 13 28.4	14.043
23	11 46 38.60	2.2598	3 55 1.6	15.408	23	13 40 3.85	2.4701	15 26 9.9	14.060
24	11 48 54.82	2.2730	S. 4 10 25.7	15.395	24	13 42 32.20	2.4748	S. 15 38 45.1	14.064

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.	Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	13 42 32.20	2.4748	S. 15° 38' 45.1"	12.384	0	15 46 0.11	2.6422	S. 23° 7' 29.3"	5.842
1	13 45 0.83	2.4726	15 51 13.9	12.427	1	15 48 38.68	2.6424	23 13 2.7	5.471
2	13 47 29.74	2.4693	16 3 36.3	12.317	2	15 51 17.32	2.6445	23 18 25.8	5.300
3	13 49 58.94	2.4680	16 15 52.0	12.306	3	15 53 56.02	2.6455	23 23 38.7	5.128
4	13 52 28.41	2.4686	16 28 1.0	12.093	4	15 56 34.78	2.6464	23 28 41.2	4.966
5	13 54 58.16	2.4683	16 40 3.2	11.878	5	15 59 13.59	2.6472	23 33 33.4	4.783
6	13 57 28.19	2.4686	16 51 58.4	11.863	6	16 1 52.44	2.6478	23 38 15.2	4.610
7	13 59 58.49	2.4673	17 3 46.6	11.744	7	16 4 31.32	2.6482	23 42 46.6	4.437
8	14 2 29.07	2.4619	17 15 27.7	11.624	8	16 7 10.23	2.6485	23 47 7.6	4.263
9	14 4 59.92	2.4604	17 27 1.5	11.502	9	16 9 49.15	2.6487	23 51 18.1	4.088
10	14 7 31.04	2.4600	17 38 28.0	11.379	10	16 12 28.06	2.6488	23 55 18.2	3.914
11	14 10 2.43	2.4594	17 49 47.0	11.254	11	16 15 7.00	2.6487	23 59 7.8	3.739
12	14 12 34.09	2.4588	18 0 58.5	11.127	12	16 17 45.92	2.6485	24 2 46.9	3.565
13	14 15 6.01	2.4583	18 12 2.3	10.998	13	16 20 24.82	2.6482	24 6 15.5	3.390
14	14 17 38.20	2.4585	18 22 58.3	10.868	14	16 23 3.70	2.6477	24 9 33.7	3.215
15	14 20 10.64	2.4488	18 33 46.5	10.737	15	16 25 42.55	2.6471	24 12 41.4	3.040
16	14 22 43.34	2.4471	18 44 26.7	10.608	16	16 28 21.35	2.6468	24 15 38.5	2.865
17	14 25 16.30	2.4413	18 54 58.8	10.468	17	16 31 0.10	2.6464	24 18 25.1	2.690
18	14 27 49.50	2.4404	19 5 22.8	10.331	18	16 33 38.80	2.6464	24 21 1.3	2.515
19	14 30 22.95	2.4406	19 15 38.6	10.198	19	16 36 17.43	2.6463	24 23 27.0	2.340
20	14 32 56.64	2.4403	19 25 46.0	10.064	20	16 38 55.98	2.6419	24 25 42.1	2.165
21	14 35 30.58	2.4376	19 35 45.0	9.913	21	16 41 34.45	2.6404	24 27 46.7	1.990
22	14 38 4.75	2.4715	19 45 35.5	9.771	22	16 44 12.83	2.6385	24 29 40.9	1.816
23	14 40 39.15	2.4726	S. 19° 55' 17.4"	9.627	23	16 46 51.11	2.6372	S. 24° 31' 24.7"	1.642
SUNDAY 6.					TUESDAY 8.				
0	14 43 13.78	2.4720	S. 20° 4 50.7"	9.481	0	16 49 29.29	2.6365	S. 24° 32' 58.0"	1.468
1	14 45 48.64	2.4637	20 14 15.1	9.333	1	16 52 7.35	2.6363	24 34 20.9	1.293
2	14 48 23.71	2.4600	20 23 30.7	9.185	2	16 54 45.28	2.6319	24 35 33.4	1.122
3	14 50 59.00	2.4580	20 32 37.4	9.036	3	16 57 23.08	2.6280	24 36 35.5	0.949
4	14 53 34.50	2.4584	20 41 35.0	8.885	4	17 0 0.75	2.6265	24 37 27.3	0.777
5	14 56 10.21	2.4586	20 50 23.5	8.733	5	17 2 38.26	2.6220	24 38 8.8	0.605
6	14 58 46.12	2.4581	20 59 2.9	8.579	6	17 5 15.62	2.6218	24 38 39.9	0.433
7	15 1 22.22	2.4538	21 7 33.1	8.425	7	17 7 52.82	2.6185	24 39 0.8	0.262
8	15 3 58.51	2.4504	21 15 53.9	8.269	8	17 10 29.84	2.6186	24 39 11.4	0.092
9	15 6 34.90	2.4504	21 24 5.3	8.112	9	17 13 6.69	2.6136	24 39 11.8	0.078
10	15 9 11.64	2.4512	21 32 7.3	7.954	10	17 15 43.35	2.6094	24 39 2.0	0.947
11	15 11 48.47	2.4512	21 39 59.8	7.795	11	17 18 19.82	2.6061	24 38 42.1	0.415
12	15 14 25.46	2.4510	21 47 42.7	7.635	12	17 20 56.08	2.6037	24 38 12.2	0.263
13	15 17 2.62	2.4505	21 55 16.0	7.473	13	17 23 32.13	2.6001	24 37 32.2	0.786
14	15 19 39.93	2.4521	22 2 39.5	7.310	14	17 26 7.97	2.6064	24 36 42.2	0.916
15	15 22 17.39	2.4526	22 9 53.3	7.147	15	17 28 43.59	2.6017	24 35 42.2	1.082
16	15 24 54.90	2.4578	22 16 57.3	6.986	16	17 31 18.97	2.6078	24 34 32.3	1.347
17	15 27 32.73	2.4591	22 23 51.3	6.818	17	17 33 54.11	2.6037	24 33 12.5	1.413
18	15 30 10.60	2.4593	22 30 35.4	6.658	18	17 36 29.01	2.6136	24 31 42.9	1.878
19	15 32 48.50	2.4591	22 37 9.6	6.487	19	17 39 3.66	2.6164	24 30 3.6	1.787
20	15 35 26.60	2.4590	22 43 33.8	6.319	20	17 41 38.06	2.6111	24 28 14.5	1.898
21	15 38 4.90	2.4577	22 49 47.9	6.150	21	17 44 12.19	2.6067	24 26 15.8	2.069
22	15 40 43.21	2.4580	22 55 51.8	5.981	22	17 46 46.06	2.6021	24 24 7.4	2.318
23	15 43 21.62	2.4585	23 1 45.6	5.812	23	17 49 19.65	2.6074	24 21 49.5	2.577
24	15 46 0.11	2.4623	S. 23° 7' 29.3"	5.643	24	17 51 52.95	2.6026	S. 24° 19' 22.2"	2.836

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11				
0	17 51 52.95	2.5526	S. 24 19 22.2	2.585	0	19 47 39.92	2.3677	S. 19 38 32.5	8.680
1	17 54 25.97	2.5478	24 16 45.4	2.692	1	19 49 55.19	2.3612	19 29 49.5	8.764
2	17 56 58.69	2.5429	24 13 59.2	2.848	2	19 52 10.06	2.3447	19 21 0.8	8.828
3	17 59 31.12	2.5379	24 11 3.7	3.002	3	19 54 24.54	2.3282	19 12 6.5	8.961
4	18 2 3.24	2.5328	24 7 59.0	3.155	4	19 56 38.64	2.3217	19 3 6.7	9.042
5	18 4 35.05	2.5276	24 4 45.1	3.307	5	19 58 52.34	2.3252	18 54 1.4	9.132
6	18 7 6.55	2.5223	24 1 22.1	3.458	6	20 1 5.66	2.3187	18 44 50.8	9.220
7	18 9 37.73	2.5169	23 57 50.1	3.608	7	20 3 18.59	2.3122	18 35 34.9	9.308
8	18 12 8.58	2.5114	23 54 9.1	3.758	8	20 5 31.13	2.3056	18 26 13.8	9.394
9	18 14 39.10	2.5059	23 50 19.2	3.906	9	20 7 43.29	2.1996	18 16 47.6	9.479
10	18 17 9.29	2.5003	23 46 20.4	4.053	10	20 9 55.08	2.1933	18 7 16.3	9.562
11	18 19 39.14	2.4947	23 42 12.8	4.198	11	20 12 6.49	2.1870	17 57 40.1	9.644
12	18 22 8.65	2.4890	23 37 56.6	4.343	12	20 14 17.52	2.1807	17 47 59.0	9.726
13	18 24 37.81	2.4831	23 33 31.7	4.486	13	20 16 28.18	2.1745	17 38 13.1	9.808
14	18 27 6.62	2.4773	23 28 58.3	4.628	14	20 18 38.46	2.1683	17 28 22.4	9.894
15	18 29 35.08	2.4713	23 24 16.4	4.768	15	20 20 48.37	2.1622	17 18 27.0	9.981
16	18 32 3.18	2.4653	23 19 26.1	4.908	16	20 22 57.92	2.1561	17 8 27.1	10.067
17	18 34 30.91	2.4592	23 14 27.5	5.046	17	20 25 7.10	2.1500	16 58 22.7	10.111
18	18 36 58.28	2.4531	23 9 20.6	5.183	18	20 27 15.92	2.1440	16 48 13.8	10.166
19	18 39 25.28	2.4470	23 4 5.5	5.318	19	20 29 24.38	2.1381	16 38 0.5	10.267
20	18 41 51.92	2.4408	22 58 42.4	5.452	20	20 31 32.49	2.1322	16 27 42.9	10.328
21	18 44 18.18	2.4346	22 53 11.3	5.585	21	20 33 40.24	2.1263	16 17 21.1	10.388
22	18 46 44.07	2.4283	22 47 32.2	5.717	22	20 35 47.64	2.1205	16 6 55.1	10.467
23	18 49 9.58	2.4219	S. 22 41 45.2	5.847	23	20 37 54.69	2.1147	S. 15 56 25.1	10.534
THURSDAY 10.					SATURDAY 12.				
0	18 51 34.70	2.4155	S. 22 35 50.5	5.976	0	20 40 1.40	2.1080	S. 15 45 51.0	10.600
1	18 53 59.44	2.4091	22 29 48.1	6.104	1	20 42 7.76	2.1023	15 35 13.0	10.666
2	18 56 23.79	2.4027	22 23 38.0	6.230	2	20 44 13.79	2.0976	15 24 31.1	10.730
3	18 58 47.76	2.3962	22 17 20.4	6.355	3	20 46 19.48	2.0920	15 13 45.4	10.792
4	19 1 11.34	2.3896	22 10 55.4	6.479	4	20 48 24.83	2.0864	15 2 56.0	10.853
5	19 3 34.53	2.3833	22 4 23.0	6.602	5	20 50 29.85	2.0809	14 52 2.9	10.914
6	19 5 57.33	2.3768	21 57 43.2	6.723	6	20 52 34.54	2.0755	14 41 6.3	10.974
7	19 8 19.74	2.3702	21 50 56.3	6.842	7	20 54 38.91	2.0702	14 30 6.1	11.033
8	19 10 41.75	2.3636	21 44 2.2	6.960	8	20 56 42.96	2.0649	14 19 2.4	11.090
9	19 13 3.36	2.3569	21 37 1.0	7.077	9	20 58 46.69	2.0596	14 7 55.4	11.145
10	19 15 24.58	2.3503	21 29 52.9	7.193	10	21 0 50.11	2.0544	13 56 45.0	11.200
11	19 17 45.40	2.3437	21 22 37.9	7.307	11	21 2 53.21	2.0492	13 45 31.4	11.263
12	19 20 5.83	2.3371	21 15 16.1	7.420	12	21 4 56.01	2.0441	13 34 14.6	11.306
13	19 22 25.86	2.3305	21 7 47.5	7.532	13	21 6 58.51	2.0391	13 22 54.7	11.367
14	19 24 45.49	2.3238	21 0 12.3	7.643	14	21 9 0.70	2.0341	13 11 31.7	11.408
15	19 27 4.72	2.3172	20 52 30.5	7.750	15	21 11 2.59	2.0291	13 0 5.8	11.467
16	19 29 23.55	2.3105	20 44 42.3	7.857	16	21 13 4.19	2.0242	12 48 36.9	11.505
17	19 31 41.98	2.3039	20 36 47.7	7.963	17	21 15 5.50	2.0194	12 37 5.1	11.562
18	19 34 0.02	2.2973	20 28 46.7	8.068	18	21 17 6.52	2.0145	12 25 30.6	11.606
19	19 36 17.66	2.2907	20 20 39.5	8.172	19	21 19 7.25	2.0096	12 13 53.3	11.643
20	19 38 34.91	2.2840	20 12 26.1	8.274	20	21 21 7.71	2.0048	12 2 13.4	11.687
21	19 40 51.75	2.2774	20 4 6.6	8.375	21	21 23 7.90	2.0000	11 50 30.8	11.731
22	19 43 8.20	2.2708	19 55 41.1	8.474	22	21 25 7.81	1.9953	11 38 45.7	11.773
23	19 45 24.26	2.2643	19 47 9.7	8.572	23	21 27 7.45	1.9918	11 26 58.1	11.814
24	19 47 39.92	2.2577	S. 19 38 32.5	8.669	24	21 29 6.83	1.9875	S. 11 15 8.0	11.854

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	21 ^h 29 ^m 6.83	1.9678	S. 11° 15' 8.0	11.844	0	23 ^h 0 ^m 40.67	1.8624	S. 1° 17' 39.3	12.709
1	21 31 5.95	1.9682	11 3 15.6	11.893	1	23 2 31.77	1.8611	1 4 56.8	12.707
2	21 33 4.81	1.9780	10 51 20.8	11.881	2	23 4 22.80	1.8499	0 52 14.5	12.704
3	21 35 3.41	1.9747	10 39 23.8	11.908	3	23 6 13.76	1.8488	0 39 32.4	12.700
4	21 37 1.77	1.9706	10 27 24.6	12.004	4	23 8 4.65	1.8477	0 26 50.5	12.695
5	21 38 59.88	1.9665	10 15 23.2	12.040	5	23 9 55.48	1.8467	0 14 9.0	12.689
6	21 40 57.75	1.9635	10 3 19.8	12.074	6	23 11 46.25	1.8457	S. 0 1 27.8	12.683
7	21 42 55.38	1.9605	9 51 14.3	12.107	7	23 13 36.97	1.8446	N. 0 11 13.0	12.677
8	21 44 52.77	1.9547	9 39 6.9	12.139	8	23 15 27.63	1.8440	0 23 53.4	12.669
9	21 46 49.94	1.9509	9 26 57.6	12.171	9	23 17 18.24	1.8432	0 36 33.3	12.660
10	21 48 46.88	1.9471	9 14 46.4	12.201	10	23 19 8.81	1.8436	0 49 12.6	12.650
11	21 50 43.59	1.9434	9 2 33.5	12.230	11	23 20 59.34	1.8416	1 1 51.3	12.640
12	21 52 40.09	1.9398	8 50 18.8	12.258	12	23 22 49.83	1.8412	1 14 29.4	12.639
13	21 54 36.37	1.9362	8 38 2.5	12.286	13	23 24 40.29	1.8407	1 27 6.9	12.616
14	21 56 32.44	1.9327	8 25 44.5	12.312	14	23 26 30.71	1.8402	1 39 43.6	12.605
15	21 58 28.30	1.9293	8 13 25.0	12.338	15	23 28 21.11	1.8398	1 52 19.5	12.592
16	22 0 23.96	1.9260	8 1 3.9	12.363	16	23 30 11.48	1.8394	2 4 54.7	12.579
17	22 2 19.42	1.9227	7 48 41.4	12.387	17	23 32 1.83	1.8391	2 17 29.0	12.565
18	22 4 14.68	1.9196	7 36 17.5	12.410	18	23 33 52.17	1.8389	2 30 2.5	12.549
19	22 6 9.75	1.9163	7 23 52.3	12.432	19	23 35 42.49	1.8397	2 42 35.0	12.533
20	22 8 4.63	1.9132	7 11 25.7	12.453	20	23 37 32.81	1.8395	2 55 6.5	12.516
21	22 9 59.33	1.9102	6 58 57.9	12.474	21	23 39 23.12	1.8394	3 7 37.0	12.499
22	22 11 53.85	1.9072	6 46 28.8	12.493	22	23 41 13.42	1.8394	3 20 6.4	12.481
23	22 13 48.19	1.9043	S. 6 33 58.6	12.512	23	23 43 3.72	1.8394	N. 3 32 34.7	12.462
MONDAY 14.					WEDNESDAY 16.				
0	22 15 42.36	1.9015	S. 6 21 27.4	12.530	0	23 44 54.03	1.8393	N. 3 45 1.8	12.442
1	22 17 36.36	1.8987	6 8 55.1	12.547	1	23 46 44.35	1.8387	3 57 27.8	12.422
2	22 19 30.20	1.8960	5 56 21.8	12.563	2	23 48 34.67	1.8389	4 9 52.5	12.401
3	22 21 23.88	1.8933	5 43 47.5	12.578	3	23 50 25.01	1.8391	4 22 15.9	12.379
4	22 23 17.40	1.8907	5 31 12.4	12.592	4	23 52 15.36	1.8394	4 34 38.0	12.356
5	22 25 10.76	1.8882	5 18 36.4	12.606	5	23 54 5.73	1.8396	4 46 58.7	12.333
6	22 27 3.98	1.8857	5 5 59.7	12.618	6	23 55 56.13	1.8402	4 59 18.0	12.309
7	22 28 57.05	1.8833	4 53 22.2	12.630	7	23 57 46.56	1.8407	5 11 35.8	12.284
8	22 30 49.98	1.8810	4 40 44.1	12.641	8	23 59 37.01	1.8412	5 23 52.1	12.266
9	22 32 42.77	1.8787	4 28 5.3	12.652	9	0 1 27.50	1.8417	5 36 6.9	12.233
10	22 34 35.43	1.8765	4 15 25.9	12.661	10	0 3 18.02	1.8423	5 48 20.1	12.206
11	22 36 27.95	1.8743	4 2 45.9	12.670	11	0 5 8.58	1.8430	6 0 31.6	12.178
12	22 38 20.35	1.8722	3 50 5.5	12.678	12	0 6 59.18	1.8438	6 12 41.5	12.160
13	22 40 12.62	1.8703	3 37 24.6	12.685	13	0 8 49.83	1.8446	6 24 49.6	12.131
14	22 42 4.78	1.8684	3 24 43.3	12.691	14	0 10 40.53	1.8454	6 36 56.0	12.091
15	22 43 56.83	1.8665	3 12 1.7	12.696	15	0 12 31.28	1.8463	6 49 0.6	12.061
16	22 45 48.76	1.8646	2 59 19.8	12.701	16	0 14 22.08	1.8473	7 1 3.3	12.029
17	22 47 40.58	1.8628	2 46 37.6	12.706	17	0 16 12.94	1.8482	7 13 4.1	11.997
18	22 49 32.30	1.8612	2 33 55.2	12.708	18	0 18 3.86	1.8492	7 25 2.9	11.964
19	22 51 23.92	1.8596	2 21 12.6	12.710	19	0 19 54.84	1.8503	7 36 59.8	11.931
20	22 53 15.45	1.8580	2 8 30.0	12.711	20	0 21 45.89	1.8514	7 48 54.6	11.897
21	22 55 6.88	1.8565	1 55 47.3	12.712	21	0 23 37.01	1.8526	8 0 47.4	11.862
22	22 56 58.23	1.8551	1 43 4.6	12.712	22	0 25 28.20	1.8538	8 12 38.0	11.826
23	22 58 49.49	1.8537	1 30 21.9	12.711	23	0 27 19.47	1.8551	8 24 26.5	11.790
24	23 0 40.67	1.8524	S. 1 17 39.3	12.709	24	0 29 10.81	1.8564	N. 8 36 12.8	11.753

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	0 29 10.81	1.8664	N. 8° 36' 12.8"	11.763	0	2 0 35.08	1.8668	N. 17° 3' 43.3"	2.113
1	0 31 2.23	1.8676	8 47 56.9	11.716	1	2 2 33.08	1.8668	17 12 47.9	2.040
2	0 32 53.74	1.8692	8 59 38.6	11.676	2	2 4 31.26	1.8711	17 21 48.1	2.966
3	0 34 45.34	1.8697	9 11 18.0	11.637	3	2 6 29.62	1.8741	17 30 43.9	2.892
4	0 36 37.02	1.8693	9 22 55.0	11.597	4	2 8 28.15	1.8771	17 39 35.2	2.817
5	0 38 28.80	1.8697	9 34 29.6	11.546	5	2 10 26.87	1.8698	17 48 22.0	2.742
6	0 40 20.67	1.8668	9 46 1.7	11.514	6	2 12 25.77	1.8622	17 57 4.2	2.666
7	0 42 12.64	1.8669	9 57 31.3	11.473	7	2 14 24.85	1.8663	18 5 41.8	2.589
8	0 44 4.70	1.8666	10 8 58.4	11.430	8	2 16 24.12	1.8698	18 14 14.8	2.510
9	0 45 56.87	1.8708	10 20 22.9	11.386	9	2 18 23.57	1.8694	18 22 43.1	2.432
10	0 47 49.14	1.8731	10 31 44.7	11.341	10	2 20 23.21	1.8664	18 31 6.6	2.353
11	0 49 41.52	1.8739	10 43 3.8	11.296	11	2 22 23.03	1.8698	18 39 25.4	2.273
12	0 51 34.01	1.8757	10 54 20.2	11.260	12	2 24 23.03	2.0016	18 47 39.3	2.193
13	0 53 26.61	1.8776	11 5 33.9	11.204	13	2 26 23.22	2.0047	18 55 48.4	2.111
14	0 55 19.32	1.8796	11 16 44.7	11.166	14	2 28 23.60	2.0078	19 3 52.6	2.029
15	0 57 12.15	1.8816	11 27 52.7	11.108	15	2 30 24.17	2.0119	19 11 51.8	1.946
16	0 59 5.10	1.8836	11 38 57.7	11.060	16	2 32 24.92	2.0141	19 19 46.1	1.863
17	1 0 58.17	1.8860	11 49 59.8	11.010	17	2 34 25.86	2.0173	19 27 35.3	1.778
18	1 2 51.37	1.8877	12 0 58.9	10.960	18	2 36 26.99	2.0206	19 35 19.5	1.693
19	1 4 44.69	1.8896	12 11 54.9	10.908	19	2 38 28.31	2.0238	19 42 58.6	1.608
20	1 6 38.14	1.8920	12 22 47.9	10.857	20	2 40 29.82	2.0267	19 50 32.5	1.523
21	1 8 31.72	1.8942	12 33 37.8	10.806	21	2 42 31.53	2.0298	19 58 1.2	1.438
22	1 10 25.44	1.8964	12 44 24.5	10.761	22	2 44 33.40	2.0329	20 5 24.7	1.347
23	1 12 19.29	1.8987	N. 12° 55' 8.0"	10.697	23	2 46 35.47	2.0360	N. 20° 12' 42.9"	1.260
FRIDAY 18.					SUNDAY 20.				
0	1 14 13.28	1.8910	N. 13° 5' 48.2"	10.642	0	2 48 37.72	2.0392	N. 20° 19' 55.8"	1.176
1	1 16 7.41	1.8938	13 16 25.1	10.587	1	2 50 40.17	2.0423	20 27 3.3	1.091
2	1 18 1.68	1.8967	13 26 58.7	10.531	2	2 52 42.80	2.0454	20 34 5.5	0.991
3	1 19 56.10	1.8992	13 37 28.9	10.475	3	2 54 45.62	2.0485	20 41 2.2	0.890
4	1 21 50.66	1.9106	13 47 55.7	10.417	4	2 56 48.62	2.0516	20 47 53.5	0.789
5	1 23 45.37	1.9180	13 58 19.0	10.360	5	2 58 51.81	2.0547	20 54 39.3	0.717
6	1 25 40.22	1.9156	14 8 38.8	10.300	6	3 0 55.19	2.0578	21 1 19.5	0.634
7	1 27 35.23	1.9181	14 18 55.0	10.240	7	3 2 58.75	2.0609	21 7 54.2	0.551
8	1 29 30.39	1.9206	14 29 7.6	10.179	8	3 5 2.50	2.0640	21 14 23.2	0.467
9	1 31 25.70	1.9232	14 39 16.5	10.118	9	3 7 6.43	2.0671	21 20 46.6	0.382
10	1 33 21.17	1.9268	14 49 21.8	10.066	10	3 9 10.55	2.0701	21 27 4.2	0.298
11	1 35 16.80	1.9296	14 59 23.3	9.994	11	3 11 14.85	2.0731	21 33 16.1	0.213
12	1 37 12.59	1.9312	15 9 21.1	9.931	12	3 13 19.32	2.0761	21 39 22.2	0.128
13	1 39 8.54	1.9330	15 19 15.0	9.867	13	3 15 23.97	2.0791	21 45 22.5	0.043
14	1 41 4.66	1.9366	15 29 5.1	9.802	14	3 17 28.81	2.0821	21 51 16.9	0.006
15	1 43 0.94	1.9393	15 38 51.2	9.736	15	3 19 33.83	2.0851	21 57 5.5	0.000
16	1 44 57.38	1.9421	15 48 33.4	9.670	16	3 21 39.02	2.0880	22 2 48.1	0.001
17	1 46 53.99	1.9449	15 58 11.6	9.603	17	3 23 44.39	2.0909	22 8 24.8	0.000
18	1 48 50.77	1.9478	16 7 45.8	9.536	18	3 25 49.93	2.0939	22 13 55.5	0.000
19	1 50 47.72	1.9507	16 17 15.9	9.467	19	3 27 55.64	2.0967	22 19 20.2	0.001
20	1 52 44.85	1.9536	16 26 41.8	9.397	20	3 30 1.53	2.0996	22 24 38.8	0.000
21	1 54 42.15	1.9564	16 36 3.6	9.337	21	3 32 7.59	2.1024	22 29 51.3	0.000
22	1 56 39.62	1.9593	16 45 21.1	9.266	22	3 34 13.82	2.1053	22 34 57.7	0.000
23	1 58 37.26	1.9622	16 54 34.4	9.195	23	3 36 20.22	2.1080	22 39 57.9	0.002
24	2 0 35.08	1.9650	N. 17° 3' 43.3"	9.113	24	3 38 26.78	2.1108	N. 22° 44' 51.9"	0.000

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23.				
0	3 38 26.78	2.1100	N.22° 44' 51.9	4.848	0	5 22 15.60	2.1090	N.24° 29' 49.9	0.606
1	3 40 33.51	2.1100	22 49 39.7	4.744	1	5 24 27.50	2.1087	24 29 9.9	0.736
2	3 42 40.40	2.1100	22 54 21.2	4.640	2	5 26 39.44	2.1088	24 28 22.8	0.848
3	3 44 47.46	2.1100	22 58 56.5	4.536	3	5 28 51.41	2.1088	24 27 28.5	0.956
4	3 46 54.67	2.1101	23 3 25.4	4.432	4	5 31 3.42	2.1084	24 26 27.0	1.066
5	3 49 2.04	2.1102	23 7 48.0	4.328	5	5 33 15.46	2.1080	24 25 18.3	1.206
6	3 51 9.57	2.1102	23 12 4.2	4.224	6	5 35 27.53	2.1071	24 24 2.3	1.326
7	3 53 17.25	2.1100	23 16 14.0	4.100	7	5 37 39.62	2.1077	24 22 39.2	1.446
8	3 55 25.08	2.1101	23 20 17.3	4.008	8	5 39 51.73	2.1070	24 21 8.8	1.566
9	3 57 33.07	2.1102	23 24 14.2	3.904	9	5 43 3.86	2.1072	24 19 31.2	1.687
10	3 59 41.20	2.1100	23 28 4.6	3.786	10	5 44 16.00	2.1076	24 17 46.3	1.807
11	4 1 49.48	2.1100	23 31 48.4	3.678	11	5 46 28.16	2.1077	24 15 54.3	1.927
12	4 3 57.90	2.1101	23 35 25.7	3.567	12	5 48 40.32	2.1076	24 13 55.0	2.046
13	4 6 6.47	2.1100	23 38 56.4	3.457	13	5 50 52.49	2.1078	24 11 48.5	2.166
14	4 8 15.17	2.1102	23 42 20.5	3.346	14	5 53 4.66	2.1078	24 9 34.8	2.286
15	4 10 24.01	2.1104	23 45 37.9	3.234	15	5 55 16.83	2.1076	24 7 13.9	2.406
16	4 12 32.96	2.1107	23 48 48.7	3.124	16	5 57 29.00	2.1076	24 4 45.7	2.526
17	4 14 42.09	2.1109	23 51 52.8	3.012	17	5 59 41.16	2.1077	24 2 10.3	2.646
18	4 16 51.33	2.1111	23 54 50.1	2.900	18	6 1 53.32	2.1075	23 59 27.8	2.766
19	4 19 0.70	2.1112	23 57 40.7	2.788	19	6 4 5.47	2.1078	23 56 38.1	2.886
20	4 21 10.19	2.1100	24 0 24.6	2.676	20	6 6 17.60	2.1081	23 53 41.2	3.006
21	4 23 19.81	2.1102	24 3 1.7	2.562	21	6 8 29.72	2.1076	23 50 37.1	3.126
22	4 25 29.54	2.1100	24 5 32.0	2.448	22	6 10 41.82	2.1075	23 47 25.8	3.246
23	4 27 39.39	2.1101	N.24° 7' 55.5	2.334	23	6 12 53.90	2.1075	N.23° 44' 7.4	3.367
TUESDAY 22.					THURSDAY 24.				
0	4 29 49.35	2.1100	N.24° 10' 12.1	2.220	0	6 15 5.96	2.1080	N.23° 40' 41.8	3.486
1	4 31 59.43	2.1100	24 12 21.8	2.106	1	6 17 17.99	2.1080	23 37 9.1	3.606
2	4 34 9.62	2.1107	24 14 24.7	1.990	2	6 19 30.00	2.1080	23 33 29.2	3.724
3	4 36 19.91	2.1104	24 16 20.6	1.874	3	6 21 41.97	2.1082	23 29 42.2	3.843
4	4 38 30.31	2.1104	24 18 9.6	1.766	4	6 23 53.91	2.1087	23 25 48.0	3.963
5	4 40 40.81	2.1108	24 19 51.6	1.643	5	6 26 5.81	2.1081	23 21 46.7	4.080
6	4 42 51.40	2.1114	24 21 26.7	1.526	6	6 28 17.68	2.1074	23 17 38.4	4.196
7	4 45 2.09	2.1100	24 22 54.8	1.410	7	6 30 29.51	2.1088	23 13 22.9	4.317
8	4 47 12.88	2.1100	24 24 15.9	1.298	8	6 32 41.30	2.1081	23 9 0.4	4.435
9	4 49 23.76	2.1100	24 25 30.0	1.176	9	6 34 53.04	2.1088	23 4 30.8	4.553
10	4 51 34.72	2.1104	24 26 37.0	1.060	10	6 37 4.74	2.1045	22 59 54.1	4.670
11	4 53 45.76	2.1104	24 27 37.0	0.941	11	6 39 16.39	2.1087	22 55 10.4	4.787
12	4 55 56.89	2.1081	24 28 29.9	0.823	12	6 41 27.98	2.1098	22 50 19.7	4.904
13	4 58 8.09	2.1102	24 29 15.7	0.706	13	6 43 39.52	2.1079	22 45 21.9	5.021
14	5 0 19.37	2.1086	24 29 54.5	0.587	14	6 45 51.01	2.1071	22 40 17.2	5.137
15	5 2 30.72	2.1087	24 30 26.2	0.469	15	6 48 2.45	2.1082	22 35 5.5	5.253
16	5 4 42.14	2.1100	24 30 50.8	0.350	16	6 50 13.83	2.1092	22 29 46.9	5.369
17	5 6 53.62	2.1119	24 31 8.3	0.231	17	6 52 25.15	2.1082	22 24 21.3	5.484
18	5 9 5.17	2.1120	24 31 18.5	0.112	18	6 54 36.41	2.1072	22 18 48.8	5.599
19	5 11 16.78	2.1080	24 31 21.7	0.007	19	6 56 47.61	2.1083	22 13 9.4	5.713
20	5 13 28.44	2.1046	24 31 17.7	0.196	20	6 58 58.75	2.1081	22 7 23.2	5.829
21	5 15 40.15	2.1087	24 31 6.5	0.346	21	7 1 9.82	2.1080	22 1 30.1	5.943
22	5 17 51.92	2.1086	24 30 48.2	0.300	22	7 3 20.82	2.1088	21 55 30.1	6.056
23	5 20 3.74	2.1072	24 30 22.7	0.486	23	7 5 31.76	2.1077	21 49 23.3	6.166
24	5 22 15.60	2.1080	N.24° 29' 49.9	0.606	24	7 7 42.63	2.1086	N.21° 43' 9.8	6.282

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	7 7 42.63	2.1806	N.21° 43' 9.8"	6.382	0	8 50 56.10	2.1233	N.14° 39' 56.7"	11.143
1	7 9 53.43	2.1794	21 36 49.5	6.385	1	8 53 3.47	2.1225	14 28 45.6	11.226
2	7 12 4.16	2.1782	21 30 22.4	6.506	2	8 55 10.80	2.1216	14 17 29.3	11.314
3	7 14 14.82	2.1770	21 23 48.6	6.620	3	8 57 18.09	2.1211	14 6 7.8	11.400
4	7 16 25.40	2.1758	21 17 8.0	6.731	4	8 59 25.33	2.1204	13 54 41.3	11.484
5	7 18 35.91	2.1746	21 10 20.8	6.842	5	9 1 32.53	2.1198	13 43 9.7	11.568
6	7 20 46.35	2.1734	21 3 26.9	6.953	6	9 3 39.70	2.1192	13 31 33.1	11.651
7	7 22 56.71	2.1721	20 56 26.4	7.063	7	9 5 46.83	2.1186	13 19 51.6	11.733
8	7 25 7.00	2.1708	20 49 19.3	7.173	8	9 7 53.93	2.1180	13 8 5.2	11.814
9	7 27 17.21	2.1696	20 42 5.6	7.283	9	9 10 0.99	2.1175	12 56 13.9	11.896
10	7 29 27.34	2.1683	20 34 45.4	7.392	10	9 12 8.03	2.1171	12 44 17.8	11.974
11	7 31 37.39	2.1669	20 27 18.6	7.501	11	9 14 15.04	2.1167	12 32 17.0	12.053
12	7 33 47.37	2.1656	20 19 45.3	7.609	12	9 16 22.03	2.1163	12 20 11.4	12.131
13	7 35 57.26	2.1643	20 12 5.5	7.717	13	9 18 29.00	2.1160	12 8 1.2	12.209
14	7 38 7.08	2.1630	20 4 19.3	7.824	14	9 20 35.95	2.1157	11 55 46.3	12.286
15	7 40 16.82	2.1617	19 56 26.6	7.931	15	9 22 42.88	2.1154	11 43 26.8	12.363
16	7 42 26.48	2.1604	19 48 27.6	8.037	16	9 24 49.80	2.1152	11 31 2.8	12.437
17	7 44 36.06	2.1590	19 40 22.2	8.143	17	9 26 56.71	2.1151	11 18 34.3	12.513
18	7 46 45.56	2.1576	19 32 10.4	8.248	18	9 29 3.61	2.1150	11 6 1.4	12.588
19	7 48 54.98	2.1563	19 23 52.3	8.353	19	9 31 10.51	2.1150	10 53 24.2	12.667
20	7 51 4.32	2.1550	19 15 28.0	8.457	20	9 33 17.41	2.1150	10 40 42.6	12.738
21	7 53 13.58	2.1537	19 6 57.4	8.561	21	9 35 24.31	2.1151	10 27 56.8	12.798
22	7 55 22.77	2.1524	18 58 20.7	8.664	22	9 37 31.22	2.1152	10 15 6.7	12.869
23	7 57 31.87	2.1511	N.18 49 37.8	8.767	23	9 39 38.13	2.1153	N.10 2 12.5	12.938
SATURDAY 26.					MONDAY 28.				
0	7 59 40.90	2.1498	N.18 40 48.7	8.869	0	9 41 45.05	2.1156	N. 9 49 14.1	13.006
1	8 1 49.85	2.1486	18 31 53.5	8.971	1	9 43 51.99	2.1157	9 36 11.7	13.073
2	8 3 58.72	2.1473	18 22 52.2	9.073	2	9 45 58.94	2.1160	9 23 5.3	13.139
3	8 6 7.52	2.1460	18 13 44.9	9.173	3	9 48 5.91	2.1164	9 9 55.0	13.204
4	8 8 16.24	2.1447	18 4 31.5	9.273	4	9 50 12.91	2.1169	8 56 40.8	13.268
5	8 10 24.88	2.1434	17 55 12.2	9.372	5	9 52 19.94	2.1174	8 43 22.8	13.332
6	8 12 33.45	2.1421	17 45 46.9	9.471	6	9 54 27.00	2.1179	8 30 1.0	13.394
7	8 14 41.94	2.1409	17 36 15.7	9.569	7	9 56 34.09	2.1185	8 16 35.5	13.456
8	8 16 50.36	2.1397	17 26 38.6	9.666	8	9 58 41.22	2.1191	8 3 6.4	13.516
9	8 18 58.71	2.1386	17 16 55.7	9.763	9	10 0 48.39	2.1198	7 49 33.6	13.576
10	8 21 6.98	2.1373	17 7 7.0	9.860	10	10 2 55.60	2.1205	7 35 57.3	13.634
11	8 23 15.19	2.1362	16 57 12.5	9.956	11	10 5 2.86	2.1215	7 22 17.5	13.691
12	8 25 23.33	2.1351	16 47 12.3	10.051	12	10 7 10.18	2.1224	7 8 34.4	13.747
13	8 27 31.40	2.1340	16 37 6.4	10.146	13	10 9 17.55	2.1233	6 54 47.9	13.803
14	8 29 39.41	2.1329	16 26 54.8	10.240	14	10 11 24.98	2.1243	6 40 58.1	13.858
15	8 31 47.35	2.1318	16 16 37.6	10.333	15	10 13 32.47	2.1254	6 27 5.0	13.911
16	8 33 55.22	2.1307	16 6 14.9	10.426	16	10 15 40.03	2.1265	6 13 8.8	13.963
17	8 36 3.03	2.1297	15 55 46.6	10.518	17	10 17 47.65	2.1277	5 59 9.5	14.014
18	8 38 10.78	2.1287	15 45 12.8	10.609	18	10 19 55.35	2.1290	5 45 7.1	14.064
19	8 40 18.47	2.1277	15 34 33.5	10.700	19	10 22 3.13	2.1303	5 31 1.8	14.112
20	8 42 26.10	2.1267	15 23 48.8	10.790	20	10 24 10.99	2.1317	5 16 53.6	14.160
21	8 44 33.68	2.1256	15 12 58.7	10.879	21	10 26 18.94	2.1332	5 2 42.5	14.207
22	8 46 41.20	2.1246	15 2 3.3	10.967	22	10 28 26.97	2.1347	4 48 28.7	14.253
23	8 48 48.67	2.1235	14 51 2.6	11.055	23	10 30 35.10	2.1363	4 34 12.2	14.297
24	8 50 56.10	2.1223	N.14 39 56.7	11.143	24	10 32 43.32	2.1379	N. 4 19 53.1	14.340

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					THURSDAY 31.				
0	10 32 43.32	2.1379	N. 4 19 53.1	14.340	0	12 18 32.40	2.3075	S. 7 32 40.7	14.768
1	10 34 51.64	2.1396	4 5 31.4	14.382	1	12 20 50.40	2.3094	7 47 25.6	14.782
2	10 37 0.07	2.1414	3 51 7.3	14.423	2	12 23 8.69	2.3074	8 2 8.6	14.698
3	10 39 8.61	2.1433	3 36 40.7	14.463	3	12 25 27.29	2.3156	8 16 49.5	14.663
4	10 41 17.26	2.1451	3 22 11.8	14.501	4	12 27 46.19	2.3176	8 31 26.2	14.626
5	10 43 26.03	2.1471	3 7 40.6	14.538	5	12 30 5.40	2.3228	8 46 4.6	14.587
6	10 45 34.91	2.1492	2 53 7.2	14.574	6	12 32 24.92	2.3290	9 0 38.7	14.546
7	10 47 43.92	2.1513	2 38 31.7	14.609	7	12 34 44.75	2.3332	9 15 10.3	14.504
8	10 49 53.06	2.1536	2 23 54.1	14.643	8	12 37 4.90	2.3366	9 29 39.2	14.459
9	10 52 2.34	2.1557	2 9 14.6	14.674	9	12 39 25.37	2.3420	9 44 5.3	14.412
10	10 54 11.75	2.1580	1 54 33.2	14.704	10	12 41 46.17	2.3498	9 58 28.6	14.363
11	10 56 21.30	2.1604	1 39 50.0	14.734	11	12 44 7.29	2.3548	10 12 48.9	14.313
12	10 58 31.00	2.1629	1 25 5.1	14.763	12	12 46 28.74	2.3603	10 27 6.1	14.260
13	11 0 40.85	2.1654	1 10 18.5	14.789	13	12 48 50.52	2.3666	10 41 20.1	14.206
14	11 2 50.85	2.1680	0 55 30.4	14.815	14	12 51 12.64	2.3714	10 55 30.7	14.148
15	11 5 1.01	2.1707	0 40 40.7	14.839	15	12 53 35.09	2.3770	11 9 37.8	14.088
16	11 7 11.34	2.1736	0 25 49.7	14.862	16	12 55 57.88	2.3837	11 23 41.3	14.027
17	11 9 21.83	2.1763	N. 0 10 57.4	14.883	17	12 58 21.01	2.3884	11 37 41.1	13.964
18	11 11 32.49	2.1792	S. 0 3 56.2	14.908	18	13 0 44.49	2.3941	11 51 37.0	13.899
19	11 13 43.33	2.1823	0 18 50.9	14.921	19	13 3 8.31	2.3999	12 5 29.0	13.832
20	11 15 54.35	2.1852	0 33 46.7	14.936	20	13 5 32.48	2.4067	12 19 16.9	13.763
21	11 18 5.55	2.1883	0 48 43.5	14.954	21	13 7 57.00	2.4116	12 33 0.6	13.692
22	11 20 16.94	2.1914	1 3 41.2	14.968	22	13 10 21.87	2.4174	12 46 40.0	13.619
23	11 22 28.52	2.1946	S. 1 18 30.7	14.980	23	13 12 47.09	2.4233	S. 13 0 14.9	13.544
WEDNESDAY 30.					FRIDAY, NOVEMBER 1.				
0	11 24 40.29	2.1979	S. 1 33 38.8	14.991	0	13 15 12.67	2.4292	S. 13 13 45.3	13.467
1	11 26 52.26	2.2013	1 48 38.6	15.001					
2	11 29 4.44	2.2047	2 3 38.9	15.009					
3	11 31 16.83	2.2082	2 18 39.6	15.015					
4	11 33 29.43	2.2118	2 33 40.7	15.020					
5	11 35 42.24	2.2154	2 48 42.0	15.023					
6	11 37 55.28	2.2193	3 3 43.5	15.025					
7	11 40 8.55	2.2230	3 18 45.0	15.026					
8	11 42 22.04	2.2269	3 33 46.5	15.023					
9	11 44 35.77	2.2308	3 48 47.8	15.020					
10	11 46 49.73	2.2348	4 3 48.9	15.015					
11	11 49 3.94	2.2388	4 18 49.6	15.008					
12	11 51 18.39	2.2429	4 33 49.9	15.000					
13	11 53 33.09	2.2471	4 48 49.6	14.990					
14	11 55 48.04	2.2514	5 3 48.7	14.978					
15	11 58 3.25	2.2557	5 18 47.0	14.965					
16	12 0 18.73	2.2601	5 33 44.5	14.950					
17	12 2 34.47	2.2646	5 48 41.0	14.933					
18	12 4 50.48	2.2691	6 3 36.5	14.914					
19	12 7 6.77	2.2737	6 18 30.8	14.894					
20	12 9 23.33	2.2783	6 33 23.8	14.871					
21	12 11 40.17	2.2830	6 48 15.4	14.847					
22	12 13 57.29	2.2878	7 3 5.5	14.821					
23	12 16 14.70	2.2926	7 17 54.0	14.793					
24	12 18 32.40	2.2975	S. 7 32 40.7	14.768					

PHASES OF THE MOON.

● New Moon, . . .	3	18	57.5
☾ First Quarter, . .	10	10	9.4
○ Full Moon, . . .	18	6	38.4
☾ Last Quarter, . .	26	9	54.7

☾ Perigee,	4	18.2
☾ Apogee,	19	18.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Aldebaran W.	81° 42' 59"	2222	83° 28' 22"	2208	85° 14' 10"	2291	87° 0' 23"	2274
	Pollux W.	39 56 35	2272	41 40 48	2260	43 25 34	2222	45 10 52	2207
	SUN E.	38 32 37	2240	36 54 37	2234	35 16 15	2212	33 37 36	2209
6	SUN W.	31 34 12	2206	33 17 54	2200	35 1 31	2403	36 45 1	2409
	α Aquilæ E.	79 15 33	2279	77 36 9	2200	75 57 8	2212	74 18 31	2222
	Fomalhaut E.	104 37 15	2200	102 56 2	2261	101 14 50	2203	99 33 41	2200
	α Pegasi E.	126 9 33	2220	124 22 20	2222	122 35 10	2255	120 48 4	2226
7	SUN W.	45 19 54	2452	47 2 14	2455	48 44 17	2477	50 26 2	2490
	α Aquilæ E.	66 12 57	2761	64 37 38	2722	63 2 59	2222	61 29 7	2262
	Fomalhaut E.	91 10 13	2451	89 30 10	2464	87 50 26	2572	86 11 1	2222
	α Pegasi E.	111 53 43	2224	110 7 19	2222	108 21 9	2222	106 35 13	2211
8	SUN W.	58 50 4	2261	60 29 53	2272	62 9 21	2402	63 48 27	2207
	Venus W.	20 28 45	2222	22 6 56	2245	23 44 50	2252	25 22 26	2271
	α Aquilæ E.	53 52 47	2222	52 24 33	2154	50 57 22	2212	49 31 41	2222
	Fomalhaut E.	77 59 31	2222	76 22 31	2702	74 45 59	2720	73 9 59	2724
	α Pegasi E.	97 49 28	2272	96 5 14	2227	94 21 20	2401	92 87 46	2412
9	SUN W.	71 58 32	2222	73 35 26	2702	75 11 58	2722	76 48 7	2722
	Venus W.	33 25 39	2742	35 1 15	2724	36 36 30	2722	38 11 22	2727
	Antares W.	20 37 17	2271	22 21 34	2224	24 5 32	2222	25 49 10	2412
	Fomalhaut E.	65 18 29	2222	63 46 4	2227	62 14 20	2222	60 43 19	2227
	α Pegasi E.	84 5 23	2424	82 24 2	2212	80 43 6	2222	79 2 33	2245
10	SUN W.	84 43 22	2224	86 17 19	2240	87 50 55	2252	89 24 10	2274
	Venus W.	46 0 24	2222	47 33 7	2227	49 5 22	2212	50 37 32	2222
	Antares W.	34 22 14	2422	36 3 49	2200	37 45 2	2212	39 25 55	2222
	Fomalhaut E.	53 20 9	2222	51 54 11	2220	50 29 12	2212	49 5 16	2270
	α Pegasi E.	70 45 57	2222	69 7 54	2222	67 30 18	2277	65 53 7	2222
	α Arietis E.	113 24 22	2200	111 43 9	2212	110 2 18	2222	108 21 47	2244
11	SUN W.	97 5 8	2224	98 36 19	2222	100 7 10	2224	101 37 43	2222
	Venus W.	58 12 36	2222	59 42 37	2222	61 12 19	2222	62 41 43	2222
	Antares W.	47 45 16	2201	49 24 9	2212	51 2 43	2222	52 40 59	2212
	α Pegasi E.	57 53 57	2201	56 19 31	2222	54 45 33	2245	53 12 4	2222
	α Arietis E.	100 4 12	2212	98 25 41	2221	96 47 28	2244	95 9 35	2222
12	SUN W.	109 5 50	2272	110 34 34	2222	112 3 1	2100	113 31 11	2112
	Venus W.	70 4 14	2122	71 31 52	2122	72 59 14	2122	74 26 21	2122
	Antares W.	60 47 45	2702	62 24 14	2712	64 0 28	2722	65 36 25	2744
	α Pegasi E.	45 32 35	2201	44 2 23	2222	42 32 48	2224	41 3 54	2222
	α Arietis E.	87 4 38	2722	85 28 31	2727	83 52 40	2742	82 17 5	2721
	Aldebaran E.	119 41 57	2761	118 6 38	2772	116 31 33	2722	114 56 41	2722
13	SUN W.	120 48 10	2172	122 14 48	2122	123 41 12	2122	125 7 22	2222
	Venus W.	81 38 6	2227	83 3 43	2227	84 29 8	2245	85 54 20	2222
	Antares W.	73 32 23	2200	75 6 51	2212	76 41 6	2222	78 15 8	2222
	α Arietis E.	74 23 3	2212	72 48 59	2222	71 15 10	2241	69 41 35	2222
	Aldebaran E.	107 5 41	2242	105 32 8	2242	103 58 48	2222	102 25 41	2271
14	Venus W.	92 57 14	2210	94 21 14	2212	95 45 3	2222	97 8 42	2227
	Antares W.	86 2 10	2272	87 34 59	2244	89 7 38	2222	90 40 6	2221
	α Aquilæ W.	40 37 0	2224	41 43 33	2244	42 51 18	2174	44 0 9	2111

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W. Pollux W. SUN E.	88 47 6 46 56 41 31 58 39	2228 2228 2228	90 34 1 48 43 2 30 19 24	2228 2227 2276	92 21 26 50 29 50 28 39 55	2227 2247 2566	94 9 14 52 17 8 27 0 16	2219 2230 2563
6	SUN W. a Aquilæ E. Fomalhaut E. a Pegasi E.	38 28 23 72 40 22 97 52 40 119 1 2	2417 2464 2510 2520	40 11 34 71 2 42 96 11 47 117 14 2	2425 2478 2481 2523	41 54 33 69 25 33 94 31 3 115 27 7	2433 2709 2530 2566	43 37 20 67 48 56 92 50 32 113 40 20	2443 2731 2539 2574
7	SUN W. a Aquilæ E. Fomalhaut E. a Pegasi E.	52 7 29 59 56 1 84 31 56 104 49 30	2504 2505 2510 2523	53 48 36 58 23 48 82 53 13 103 4 4	2517 2545 2524 2526	55 29 25 56 52 26 81 14 53 101 18 55	2532 2598 2646 2545	57 9 54 55 22 7 79 37 0 99 34 2	2545 2643 2653 2559
8	SUN W. Venus W. a Aquilæ E. Fomalhaut E. a Pegasi E.	65 27 12 26 59 45 48 7 12 71 34 31 90 54 33	2524 2526 2529 2779 2421	67 5 35 28 36 44 46 44 9 69 59 36 89 11 42	2530 2701 2429 2807 2446	68 43 37 30 13 23 45 22 37 68 25 17 87 20 13	2527 2716 2626 2725 2463	70 21 15 31 49 41 44 2 40 66 51 34 85 47 7	2572 2723 2610 2664 2478
9	SUN W. Venus W. Antares W. Fomalhaut E. a Pegasi E.	78 23 55 39 45 54 27 32 26 59 13 2 77 22 23	2786 2614 2426 2525 2525	79 59 20 41 20 4 20 15 26 57 43 33 75 42 40	2774 2630 2441 2575 2523	81 34 22 42 53 53 30 58 3 56 14 53 74 3 20	2790 2646 2455 2117 2601	83 9 3 44 27 19 32 40 19 54 47 4 72 24 26	2607 2664 2470 2162 2619
10	SUN W. Venus W. Antares W. Fomalhaut E. a Pegasi E. a Arietis E.	90 57 2 52 9 14 41 6 28 47 42 25 64 16 24 106 41 35	2580 2545 2544 2425 2717 2520	92 29 34 53 40 35 42 46 40 46 20 45 62 40 7 105 1 44	2585 2523 2459 2420 2727 2574	94 1 46 55 11 36 44 26 31 45 0 20 61 4 16 103 22 14	2525 2578 2573 2571 2756 2598	95 33 37 56 42 16 46 6 3 43 41 14 59 26 53 101 43 3	2588 2594 2567 2649 2779 2603
11	SUN W. Venus W. Antares W. a Pegasi E. a Arietis E.	103 7 57 64 10 50 54 18 56 51 39 6 93 31 50	2614 2580 2556 2524 2573	104 37 52 65 39 38 55 56 35 50 6 39 91 54 42	2529 2583 2570 2520 2585	106 7 29 67 8 8 57 38 55 48 34 45 90 17 43	2543 2598 2582 2544 2599	107 36 48 68 36 20 59 10 59 47 3 22 88 41 2	2567 2118 2595 2573 2712
12	SUN W. Venus W. Antares W. a Pegasi E. a Arietis E. Aldebaran E.	114 59 7 75 53 12 67 12 7 39 35 40 80 41 46 113 22 2	2126 2178 2750 2123 2773 2523	116 26 45 77 19 48 68 47 33 38 8 11 79 6 43 111 47 37	2126 2180 2767 2173 2765 2513	117 54 8 78 46 9 70 22 44 36 41 30 77 31 55 110 13 26	2151 2203 2778 2216 2796 2523	119 21 16 80 12 15 71 57 41 35 15 40 75 57 22 106 39 27	2163 2216 2789 2522 2807 2532
13	SUN W. Venus W. Antares W. a Arietis E. Aldebaran E.	126 33 19 87 19 19 79 48 57 68 8 12 100 52 45	2223 2570 2540 2501 2501	127 59 1 88 44 5 81 22 33 66 35 3 99 20 2	2224 2580 2549 2570 2590	129 24 30 90 8 40 82 55 57 65 2 7 97 47 30	2444 2590 2568 2581 2599	130 49 46 91 33 3 84 29 10 63 29 23 96 15 9	2555 2300 2568 2590 2507
14	Venus W. Antares W. a Aquilæ W.	98 32 11 92 12 24 45 10 6	2345 2509 2555	99 55 30 93 44 32 46 20 45	2344 2515 2505	101 18 39 95 16 30 47 32 20	2362 2524 2550	102 41 89 96 48 18 48 44 40	2360 2531 2518

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
14	α Arietis E.	61° 56' 51"	2900	60° 24' 32"	2909	58° 52' 24"	2918	57° 20' 28"	2927
	Aldebaran E.	94 42 59	2916	93 11 0	2924	91 39 12	2933	90 7 35	2940
15	Venus W.	104 4 31	2977	105 27 14	2985	106 49 48	2992	108 12 14	3000
	Antares W.	98 19 57	2936	99 51 28	2945	101 22 50	2951	102 54 4	2956
	α Aquilæ W.	49 57 42	2982	51 11 20	2948	52 25 33	2918	53 40 17	2792
	α Arietis E.	49 43 38	2971	48 12 49	2960	46 42 11	2968	45 11 43	2996
	Aldebaran E.	82 31 54	2978	81 1 14	2985	79 30 43	2998	78 0 21	2999
	Pollux E.	124 24 4	2994	122 53 44	2999	121 23 30	3004	119 53 22	3000
16	α Aquilæ W.	60 0 10	2989	61 17 9	2974	62 34 24	2961	63 51 53	2949
	Fomalhaut W.	36 32 13	4479	37 36 24	4384	38 42 0	4300	39 48 53	4223
	α Arietis E.	37 42 4	2940	36 12 41	2951	34 43 31	2960	33 14 32	2971
	Aldebaran E.	70 30 54	2931	69 1 0	2938	67 31 34	2944	66 2 16	2951
	Pollux E.	112 24 12	2929	110 54 35	2934	109 25 5	2941	107 55 42	2944
17	α Aquilæ W.	70 22 11	2903	71 40 42	2908	72 59 19	2922	74 18 2	2937
	Fomalhaut W.	45 39 2	2945	46 51 36	2904	48 4 51	2970	49 18 41	2936
	α Pegasi W.	23 5 47	4107	24 15 42	2990	25 27 31	2994	26 40 57	2913
	Aldebaran E.	58 37 37	2980	57 9 3	2987	55 40 37	2991	54 12 17	2987
	Pollux E.	100 30 1	2984	99 1 7	2987	97 32 17	2973	96 3 33	2974
18	α Aquilæ W.	80 52 36	2974	82 11 39	2978	83 30 43	2973	84 49 47	2972
	Fomalhaut W.	55 35 34	2709	56 52 12	2991	58 9 9	2972	59 26 26	2957
	α Pegasi W.	33 5 45	2947	34 25 17	2916	35 45 25	2984	37 6 7	2959
	Aldebaran E.	46 52 30	2129	45 24 56	2137	43 57 31	2144	42 30 15	2153
	Pollux E.	88 40 49	2991	87 12 28	2994	85 44 11	2998	84 15 56	2999
19	α Aquilæ W.	91 25 0	2978	92 43 58	2982	94 2 52	2984	95 21 44	2988
	Fomalhaut W.	65 56 41	2983	67 15 23	2964	68 34 15	2976	69 53 17	2966
	α Pegasi W.	43 55 55	2965	45 18 52	2951	46 42 5	2959	48 5 31	2928
	Aldebaran E.	35 16 25	2198	33 50 14	2210	32 24 17	2224	30 58 36	2229
	Pollux E.	76 55 31	2111	75 27 35	2113	73 59 41	2114	72 31 49	2117
20	α Aquilæ W.	101 54 51	2913	103 13 11	2920	104 31 24	2927	105 49 29	2934
	Fomalhaut W.	76 30 29	2934	77 50 16	2929	79 10 8	2926	80 30 5	2921
	α Pegasi W.	55 5 35	2284	56 30 5	2276	57 54 44	2270	59 19 30	2264
	Pollux E.	65 13 4	2125	63 45 25	2126	62 17 47	2128	60 50 11	2129
	Regulus E.	102 0 52	2987	100 32 26	2987	99 4 1	2987	97 35 35	2987
	Jupiter E.	122 10 7	2176	120 43 28	2174	119 16 49	2173	117 50 8	2172
	Saturn E.	122 10 54	2163	120 43 48	2162	119 16 41	2151	117 49 38	2149
21	Fomalhaut W.	87 10 52	2904	88 31 12	2903	89 51 33	2900	91 11 57	2898
	α Pegasi W.	66 25 8	2226	67 50 35	2220	69 16 9	2226	70 41 49	2220
	α Arietis W.	22 47 48	2199	24 13 58	2163	25 40 27	2168	27 7 14	2166
	Pollux E.	53 32 32	2134	52 5 4	2136	50 37 37	2126	49 10 11	2127
	Regulus E.	90 13 13	2982	88 44 41	2979	87 16 6	2977	85 47 28	2974
	Saturn E.	110 33 23	2140	109 6 2	2138	107 38 38	2136	106 11 11	2123
	Jupiter E.	110 36 15	2163	109 9 22	2161	107 42 26	2159	106 15 28	2157
22	Fomalhaut W.	97 54 20	2494	99 14 51	2494	100 35 22	2494	101 55 53	2494
	α Pegasi W.	77 51 41	2193	79 17 58	2188	80 44 22	2183	82 10 52	2176
	α Arietis W.	34 24 22	2108	35 52 22	2101	37 20 31	2092	38 48 50	2083
	Pollux E.	41 53 23	2144	40 26 7	2147	38 58 54	2149	37 31 44	2153
	Regulus E.	78 23 36	2980	76 54 37	2986	75 25 34	2982	73 56 26	2947

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	α Arietis E.	55° 48' 44"	3036	54° 17' 11"	3045	52° 45' 49"	3054	51° 14' 38"	3063
	Aldebaran E.	88 36 7	3048	87 4 49	3056	85 33 41	3064	84 2 43	3071
15	Venus W.	109 34 31	3406	110 56 41	3412	112 18 44	3418	113 40 40	3425
	Antares W.	104 25 10	3064	105 56 8	3069	107 26 59	3076	108 57 42	3082
	α Aquilæ W.	54 55 28	3768	56 11 6	3744	57 27 7	3734	58 43 29	3706
	α Arietis E.	43 41 25	3005	42 11 19	3014	40 41 23	3023	39 11 38	3031
	Aldebaran E.	76 30 7	3005	75 0 1	3013	73 30 4	3019	72 0 15	3026
	Pollux E.	118 23 20	3014	116 53 25	3019	115 23 36	3023	113 53 52	3027
16	α Aquilæ W.	65 9 35	3637	66 27 29	3627	67 45 34	3619	69 3 48	3610
	Fomalhaut W.	40 56 58	4155	42 6 7	4095	43 16 14	4040	44 27 14	3991
	α Arietis E.	31 45 47	3063	30 17 15	3094	28 48 58	3106	27 20 56	3116
	Aldebaran E.	64 33 6	3085	63 4 3	3063	61 35 8	3068	60 6 19	3073
	Pollux E.	106 26 24	3048	104 57 11	3052	103 28 3	3056	101 59 0	3060
17	α Aquilæ W.	75 36 49	3584	76 55 41	3580	78 14 37	3578	79 33 35	3576
	Fomalhaut W.	50 33 6	3805	51 48 3	3777	53 3 29	3758	54 19 20	3731
	α Pegasi W.	27 55 46	3743	29 11 48	3681	30 28 55	3631	31 46 56	3587
	Aldebaran E.	52 44 4	3105	51 16 0	3110	49 48 2	3116	48 20 12	3123
	Pollux E.	94 34 52	3078	93 6 15	3081	91 37 42	3085	90 9 14	3087
18	α Aquilæ W.	86 8 52	3573	87 27 56	3574	88 46 59	3578	90 6 0	3576
	Fomalhaut W.	60 43 59	3641	62 1 49	3628	63 19 53	3615	64 38 11	3604
	α Pegasi W.	38 27 17	3435	39 48 54	3415	41 10 54	3396	42 33 15	3379
	Aldebaran E.	41 3 9	3160	39 36 12	3168	38 9 25	3178	36 42 49	3188
	Pollux E.	82 47 44	3101	81 19 36	3108	79 51 32	3106	78 23 30	3100
19	α Aquilæ W.	96 40 31	3592	97 59 14	3597	99 17 52	3602	100 36 24	3607
	Fomalhaut W.	71 12 28	3550	72 31 47	3552	73 51 14	3545	75 10 48	3539
	α Pegasi W.	49 29 10	3318	50 53 1	3310	52 17 2	3300	53 41 14	3292
	Aldebaran E.	29 33 13	3257	28 8 11	3276	26 43 30	3298	25 19 16	3323
	Pollux E.	71 4 0	3119	69 36 13	3120	68 8 28	3122	66 40 45	3124
20	α Aquilæ W.	107 7 27	3643	108 25 15	3652	109 42 53	3663	111 0 21	3673
	Fomalhaut W.	81 50 6	3516	83 10 12	3513	84 30 22	3509	85 50 36	3507
	α Pegasi W.	60 44 24	3259	62 9 24	3252	63 34 32	3246	64 59 47	3241
	Pollux E.	59 22 37	3130	57 55 4	3131	56 27 32	3123	55 0 1	3123
	Regulus E.	96 7 9	3085	94 38 42	3085	93 10 14	3083	91 41 44	3082
	Jupiter E.	116 23 25	3170	114 56 40	3168	113 29 53	3168	112 3 5	3166
	Saturn E.	116 22 23	3148	114 55 11	3146	113 27 57	3144	112 0 41	3143
21	Fomalhaut W.	92 32 23	3497	93 52 50	3496	95 13 19	3494	96 33 50	3495
	α Pegasi W.	72 7 35	3314	73 33 27	3309	74 59 26	3304	76 25 30	3298
	α Arietis W.	28 34 14	3145	30 1 28	3135	31 28 54	3125	32 56 33	3117
	Pollux E.	47 42 46	3138	46 15 23	3140	44 48 2	3141	43 20 42	3142
	Regulus E.	84 18 47	3073	82 50 4	3071	81 21 19	3068	79 52 30	3064
	Saturn E.	104 43 41	3129	103 16 7	3126	101 48 29	3123	100 20 47	3119
	Jupiter E.	104 48 27	3153	103 21 22	3149	101 54 12	3147	100 26 59	3143
22	Fomalhaut W.	103 16 24	3495	104 36 54	3497	105 57 22	3499	107 17 47	3499
	α Pegasi W.	83 37 30	3171	85 4 14	3165	86 31 5	3159	87 58 3	3153
	α Arietis W.	40 17 20	3076	41 45 59	3068	43 14 48	3060	44 43 46	3052
	Pollux E.	36 4 39	3157	34 37 38	3161	33 10 42	3168	31 43 54	3174
	Regulus E.	72 27 12	3043	70 57 51	3038	69 28 25	3033	67 58 53	3026

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LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	IIIh.	P. L. of DM.	VIh.	P. L. of DM.	IXh.	P. L. of DM.
22	Saturn E.	98° 53' 0	3114	97° 25' 8	3111	95° 57' 12	3106	94° 29' 16	3102
	Jupiter E.	98 59 42	3139	97 32 20	3135	96 4 53	3130	94 37 20	3124
23	α Pegasi W.	89 25 9	3147	90 52 22	3140	92 19 43	3133	93 47 12	3127
	α Arietis W.	46 12 54	3044	47 42 12	3036	49 11 41	3037	50 41 20	3018
	Aldebaran W.	15 8 45	3044	16 26 32	3033	17 46 20	3046	19 7 45	3376
	Regulus E.	66 29 13	3023	64 59 27	3016	63 29 33	3009	61 59 31	3002
	Saturn E.	87 7 27	3073	85 38 45	3067	84 9 55	3060	82 40 57	3048
	Jupiter E.	87 18 0	3086	85 49 46	3091	84 21 26	3084	82 52 57	3077
	SUN E.	128 38 57	3406	127 16 49	3400	125 54 32	3391	124 32 5	3382
24	α Pegasi W.	101 6 44	3091	102 35 5	3082	104 3 36	3074	105 32 17	3067
	α Arietis W.	58 12 24	2971	59 43 13	2960	61 14 16	2960	62 45 31	2940
	Aldebaran W.	26 11 22	3103	27 38 28	3124	29 6 8	3006	30 34 23	3072
	Regulus E.	54 27 7	2964	52 56 9	2965	51 25 0	2966	49 53 40	2936
	Saturn E.	75 13 45	3013	73 43 48	3003	72 13 39	3094	70 43 19	2996
	Jupiter E.	75 28 9	3086	73 58 41	3026	72 29 1	3016	70 59 8	3006
	SUN E.	117 37 12	3333	116 13 39	3328	114 49 54	3313	113 25 57	3301
25	α Arietis W.	70 25 21	2980	71 58 6	2993	73 31 6	2964	75 4 24	2948
	Aldebaran W.	38 2 40	2964	39 33 37	2946	41 4 58	2926	42 36 44	2909
	Regulus E.	42 13 56	2987	40 41 21	2976	39 8 32	2966	37 35 30	2935
	Saturn E.	63 8 30	2961	61 36 51	2921	60 4 59	2909	58 32 51	2897
	Jupiter E.	63 26 33	2992	61 55 20	2941	60 23 53	2926	58 52 10	2916
	SUN E.	106 22 42	3337	104 57 17	3324	103 31 37	3306	102 5 38	3196
26	α Arietis W.	82 55 21	2709	84 30 30	2706	86 5 59	2730	87 41 49	2723
	Aldebaran W.	50 21 21	2917	51 55 27	2799	53 29 56	2781	55 4 49	2768
	Saturn E.	50 48 19	2935	49 14 36	2921	47 40 35	2906	46 6 18	2796
	Jupiter E.	51 9 35	2960	49 36 14	2937	48 2 34	2924	46 26 37	2910
	SUN E.	94 51 23	3117	93 23 34	3101	91 55 26	3064	90 26 56	3067
27	α Arietis W.	95 46 19	2939	97 24 21	2921	99 2 47	2906	100 41 35	2897
	Aldebaran W.	63 5 16	2970	64 42 36	2961	66 20 22	2933	67 58 32	2914
	Pollux W.	21 56 46	2917	23 28 43	2963	25 1 49	2916	26 35 57	2778
	Saturn E.	38 10 46	2735	36 34 52	2723	34 58 43	2713	33 22 21	2704
	Jupiter E.	38 34 22	2744	36 58 40	2730	35 22 40	2717	33 46 23	2706
	SUN E.	82 59 8	2977	81 28 27	2969	79 57 22	2939	78 25 53	2929
28	Aldebaran W.	76 15 55	2816	77 56 43	2499	79 37 57	2490	81 19 38	2481
	Pollux W.	34 39 27	2901	36 18 20	2874	37 57 51	2846	39 38 0	2821
	SUN E.	70 42 18	2923	69 8 19	2905	67 33 54	2783	65 59 5	2763
29	Aldebaran W.	89 54 46	2906	91 39 7	2949	93 23 55	2931	95 9 10	2912
	Pollux W.	48 7 29	2901	49 51 3	2976	51 35 9	2957	53 19 45	2937
	SUN E.	57 58 21	2966	56 20 54	2946	54 43 2	2937	53 4 44	2909
30	Aldebaran W.	104 1 42	2230	105 49 25	2214	107 37 32	2200	109 26 0	2184
	Pollux W.	62 10 9	2239	63 57 39	2230	65 45 36	2204	67 33 58	2196
	Regulus W.	25 9 6	2254	26 56 13	2230	28 43 56	2206	30 32 12	2196
	SUN E.	44 47 4	2923	43 6 21	2906	41 25 15	2491	39 43 49	2476
31	Pollux W.	76 41 53	2119	78 32 34	2099	80 23 34	2086	82 14 54	2078
	Regulus W.	39 40 54	2096	41 31 56	2084	43 23 20	2070	45 15 5	2068
	SUN E.	31 11 51	2416	29 28 39	2409	27 45 17	2406	26 1 45	2396

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DIF.	XVh.	P. L. of DIF.	XVIIIh.	P. L. of DIF.	XXIh.	P. L. of DIF.
22	Saturn E.	93° 1' 3"	3006	91° 32' 49"	3001	90° 4' 29"	3006	88° 36' 2"	3079
	Jupiter E.	93 9 40	3120	91 41 55	3116	90 14 4	3110	88 46 6	3103
23	α Pegasi W.	95 14 49	3119	96 42 35	3113	98 10 29	3105	99 38 32	3088
	α Arietis W.	52 11 10	3000	53 41 11	3000	55 11 24	2991	56 41 48	2981
	Aldebaran W.	20 30 30	3315	21 54 24	3265	23 19 16	3223	24 44 58	3188
	Regulus E.	60 29 21	2995	58 59 2	2967	57 28 33	2960	55 57 55	2973
	Saturn E.	81 11 50	3045	79 42 33	3038	78 13 7	3030	76 43 31	3023
	Jupiter E.	81 24 19	3000	79 55 32	3001	78 26 35	3002	76 57 27	3044
	Sun E.	123 9 28	3373	121 46 40	3364	120 23 42	3354	119 0 33	3344
24	α Pegasi W.	107 1 7	3050	108 30 7	3050	109 59 18	3043	111 28 38	3000
	α Arietis W.	64 16 59	2928	65 48 43	2917	67 20 40	2905	68 52 53	2903
	Aldebaran W.	32 3 7	3048	33 32 20	3036	35 2 1	3005	36 32 8	2965
	Regulus E.	48 22 7	2927	46 50 23	2918	45 18 27	2906	43 46 18	2908
	Saturn E.	69 12 48	2974	67 42 3	2964	66 11 5	2954	64 39 54	2943
	Jupiter E.	69 29 3	2907	67 58 46	2900	66 28 16	2975	64 57 32	2963
	Sun E.	112 1 47	3289	110 37 23	3276	109 12 44	3264	107 47 50	3232
25	α Arietis W.	76 37 58	2937	78 11 51	2913	79 46 2	2798	81 20 32	2784
	Aldebaran W.	44 8 53	2930	45 41 25	2971	47 14 21	2954	48 47 39	2935
	Regulus E.	36 2 14	2945	34 28 45	2936	32 55 2	2924	31 21 5	2914
	Saturn E.	57 0 28	2985	55 27 49	2973	53 54 55	2960	52 21 45	2948
	Jupiter E.	57 20 11	2904	55 47 57	2901	54 15 27	2978	52 42 40	2964
	Sun E.	100 39 24	3180	99 12 51	3166	97 46 1	3149	96 18 51	3134
26	α Arietis W.	89 17 59	2708	90 54 31	2690	92 31 25	2673	94 8 41	2667
	Aldebaran W.	56 40 5	2744	58 15 46	2735	59 51 52	2707	61 28 22	2690
	Saturn E.	44 31 45	2788	42 56 55	2770	41 21 48	2767	39 46 24	2747
	Jupiter E.	44 54 22	2798	43 19 49	2783	41 44 59	2769	40 9 50	2758
	Sun E.	88 58 7	3049	87 28 55	3033	85 59 22	3014	84 29 26	2996
27	α Arietis W.	102 20 48	2909	104 0 25	2851	105 40 27	2834	107 20 53	2877
	Aldebaran W.	69 37 8	2904	71 16 11	2975	72 55 40	2957	74 35 34	2938
	Pollux W.	28 11 1	2723	29 46 58	2697	31 23 42	2683	33 1 12	2639
	Saturn E.	31 45 46	2906	30 9 1	2989	28 32 7	2965	26 55 7	2953
	Jupiter E.	32 9 50	2908	30 33 1	2967	28 56 0	2981	27 18 55	2978
	Sun E.	76 54 0	3001	75 21 42	2981	73 48 59	3003	72 15 51	2943
28	Aldebaran W.	83 1 46	2443	84 44 21	2424	86 27 22	2404	88 10 51	2388
	Pollux W.	41 18 44	2494	43 0 5	2470	44 42 0	2446	46 24 29	2424
	Sun E.	64 23 48	2744	62 48 6	2723	61 11 57	2703	59 35 21	2698
29	Aldebaran W.	96 54 50	2906	98 40 56	2879	100 27 27	2862	102 14 22	2845
	Pollux W.	55 4 51	2915	56 50 28	2906	58 36 33	2976	60 23 8	2956
	Sun E.	51 26 1	2901	49 46 53	2973	48 7 20	2966	46 27 24	2936
30	Aldebaran W.	111 14 51	3170	113 4 3	3186	114 53 34	3145	116 43 25	3130
	Pollux W.	69 22 46	2170	71 11 58	2165	73 1 34	2140	74 51 32	2126
	Regulus W.	32 21 1	2167	34 10 19	2148	36 0 5	2133	37 50 16	2114
	Sun E.	38 2 1	2402	36 19 54	2400	34 37 30	2437	32 54 48	2426
31	Pollux W.	84 6 32	3004	85 58 26	3044	87 50 36	3045	89 43 0	3039
	Regulus W.	47 7 9	3046	48 59 33	3094	50 52 14	3094	52 45 11	3015
	Sun E.	24 18 8	3206	22 34 27	3208	20 50 49	3403	19 7 18	3411

AT GREENWICH APPARENT NOON.

AT GREENWICH APPARENT NOON.										
Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.	
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
Fri.	1	^h 14 ^m 26 ^s 41.22	9.814	S. 14° 31' 44.8"	47.99	16' 9.96"	66.98	^m 16 ^s 17.73	0.043	
Sat.	2	14 30 37.12	9.847	14 50 49.5	47.39	16 10.21	67.09	16 18.38	0.010	
Sun.	3	14 34 33.84	9.881	15 9 39.8	46.77	16 10.45	67.21	16 18.21	0.024	
Mon.	4	14 38 31.37	9.915	15 28 15.2	46.14	16 10.69	67.33	16 17.24	0.058	
Tues.	5	14 42 29.71	9.949	15 46 35.3	45.49	16 10.93	67.45	16 15.44	0.092	
Wed.	6	14 46 28.88	9.983	16 4 39.6	44.83	16 11.17	67 57	16 12.80	0.126	
Thur.	7	14 50 28.88	10.017	16 22 27.6	44.15	16 11.41	67.69	16 9.33	0.160	
Fri.	8	14 54 29.71	10.051	16 39 59.1	43.45	16 11.65	67.81	16 5.05	0.194	
Sat.	9	14 58 31.36	10.085	16 57 13.6	42.73	16 11.89	67.93	15 59.94	0.228	
Sun.	10	15 2 33.84	10.120	17 14 10.6	41.99	16 12.12	68.05	15 54.02	0.263	
Mon.	11	15 6 37.15	10.155	17 30 49.8	41.24	16 12.35	68.17	15 47.27	0.298	
Tues.	12	15 10 41.30	10.189	17 47 10.8	40.47	16 12.57	68.29	15 39.68	0.332	
Wed.	13	15 14 46.29	10.224	18 3 13.3	39.69	16 12.79	68.41	15 31.26	0.366	
Thur.	14	15 18 52.11	10.259	18 18 56.9	38.90	16 13.01	68.53	15 22.00	0.400	
Fri.	15	15 22 58.76	10.293	18 34 21.1	38.08	16 13.22	68.65	15 11.92	0.435	
Sat.	16	15 27 6.24	10.328	18 49 25.6	37.25	16 13.43	68.76	15 1.01	0.471	
Sun.	17	15 31 14.56	10.363	19 4 10.0	36.41	16 13.63	68.88	14 49.27	0.506	
Mon.	18	15 35 23.72	10.397	19 18 33.9	35.55	16 13.83	69.00	14 36.70	0.541	
Tues.	19	15 39 33.71	10.431	19 32 37.0	34.68	16 14.03	69.11	14 23.28	0.576	
Wed.	20	15 43 44.53	10.466	19 46 19.1	33.79	16 14.22	69.22	14 9.04	0.611	
Thur.	21	15 47 56.17	10.500	19 59 39.6	32.88	16 14.41	69.33	13 53.99	0.644	
Fri.	22	15 52 8.62	10.534	20 12 38.1	31.96	16 14.59	69.44	13 38.13	0.677	
Sat.	23	15 56 21.87	10.567	20 25 14.3	31.02	16 14.76	69.55	13 21.48	0.710	
Sun.	24	16 0 35.93	10.600	20 37 28.0	30.08	16 14.93	69.66	13 4.02	0.743	
Mon.	25	16 4 50.78	10.633	20 49 18.6	29.12	16 15.10	69.76	12 45.75	0.776	
Tues.	26	16 9 6.40	10.665	21 0 45.8	28.13	16 15.27	69.86	12 26.73	0.808	
Wed.	27	16 13 22.77	10.695	21 11 49.4	27.13	16 15.43	69.96	12 6.97	0.838	
Thur.	28	16 17 39.88	10.725	21 22 29.0	26.12	16 15.59	70.06	11 46.47	0.868	
Fri.	29	16 21 57.71	10.755	21 32 44.3	25.10	16 15.74	70.15	11 25.26	0.898	
Sat.	30	16 26 16.22	10.783	21 42 34.9	24.07	16 15.89	70.24	11 3.37	0.928	
Sun.	31	16 30 35.41	10.810	S. 21° 52' 0.5"	23.03	16 16.04	70.33	10 40.80	0.956	

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sidereal Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Fri.	1	^h 14 ^m 26 ^s 43.88	9.814	S. 14° 31' 57.8"	47.99	^m 16 ^s 17.74	0.043	^h 14 ^m 43 ^s 1.62
Sat.	2	14 30 39.79	9.847	14 51 2.4	47.30	16 18.39	0.010	14 46 58.18
Sun.	3	14 34 36.52	9.881	15 9 52.5	46.77	16 18.21	0.024	14 50 54.73
Mon.	4	14 38 34.06	9.915	15 28 27.7	46.14	16 17.23	0.058	14 54 51.29
Tues.	5	14 42 32.41	9.949	15 46 47.6	45.49	16 15.43	0.092	14 58 47.84
Wed.	6	14 46 31.58	9.983	16 4 51.7	44.83	16 12.82	0.126	15 2 44.40
Thur.	7	14 50 31.58	10.017	16 22 39.5	44.15	16 9.37	0.160	15 6 40.95
Fri.	8	14 54 32.41	10.051	16 30 10.8	43.45	16 5.10	0.194	15 10 37.51
Sat.	9	14 58 34.06	10.085	16 57 25.1	42.73	16 0.00	0.228	15 14 34.06
Sun.	10	15 2 36.53	10.120	17 14 21.8	41.99	15 54.09	0.263	15 18 30.62
Mon.	11	15 6 39.83	10.155	17 31 0.7	41.24	15 47.35	0.298	15 22 27.18
Tues.	12	15 10 43.97	10.189	17 47 21.4	40.47	15 39.76	0.332	15 26 23.73
Wed.	13	15 14 48.94	10.224	18 3 23.6	39.69	15 31.35	0.366	15 30 20.29
Thur.	14	15 18 54.74	10.259	18 19 6.9	38.90	15 22.10	0.400	15 34 16.84
Fri.	15	15 23 1.37	10.293	18 34 30.8	38.08	15 12.03	0.435	15 38 13.40
Sat.	16	15 27 8.83	10.328	18 49 34.9	37.25	15 1.13	0.471	15 42 9.96
Sun.	17	15 31 17.12	10.363	19 4 19.0	36.41	14 49.39	0.506	15 46 6.51
Mon.	18	15 35 26.25	10.397	19 18 42.6	35.55	14 36.82	0.541	15 50 3.07
Tues.	19	15 39 36.21	10.431	19 32 45.4	34.68	14 23.41	0.576	15 53 59.62
Wed.	20	15 43 47.00	10.466	19 46 27.1	33.79	14 9.18	0.611	15 57 56.18
Thur.	21	15 47 58.60	10.500	19 59 47.2	32.88	13 54.14	0.644	16 1 52.74
Fri.	22	15 52 11.01	10.534	20 12 45.3	31.96	13 38.28	0.677	16 5 49.29
Sat.	23	15 56 24.22	10.567	20 25 21.1	31.02	13 21.63	0.710	16 9 45.85
Sun.	24	16 0 38.24	10.600	20 37 34.4	30.08	13 4.17	0.743	16 13 42.41
Mon.	25	16 4 53.05	10.633	20 49 24.7	29.12	12 45.91	0.776	16 17 38.97
Tues.	26	16 9 8.62	10.665	21 0 51.6	28.13	12 26.90	0.808	16 21 35.52
Wed.	27	16 13 24.94	10.696	21 11 54.8	27.13	12 7.14	0.838	16 25 32.08
Thur.	28	16 17 41.99	10.725	21 22 34.0	26.12	11 46.64	0.868	16 29 28.63
Fri.	29	16 21 59.76	10.755	21 32 49.0	25.10	11 25.43	0.898	16 33 25.19
Sat.	30	16 26 18.21	10.783	21 42 39.3	24.07	11 3.54	0.928	16 37 21.75
Sun.	31	16 30 37.34	10.810	S. 21° 52' 4.6"	23.03	10 40.97	0.956	16 41 18.31

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
Day of the Month.	Day of the Year.	True LONGITUDE.		Dist. for 1 hour.	LATITUDE.				
		λ	λ'						
1	305	219° 4' 58.7	4' 1.0	150.35	—0.70	9.9964217	45.8	9 15 27.14	
2	306	220 5 8.0	4 10.2	150.43	0.65	.9963120	45.6	9 11 31.23	
3	307	221 5 19.1	4 21.2	150.50	0.57	.9962027	45.4	9 7 35.32	
4	308	222 5 32.1	4 34.1	150.57	0.47	.9960939	45.2	9 3 39.41	
5	309	223 5 46.6	4 48.4	150.64	0.37	.9959855	44.9	8 59 43.50	
6	310	224 6 2.8	5 4.4	150.71	0.25	.9958778	44.6	8 55 47.59	
7	311	225 6 20.6	5 22.1	150.77	—0.12	.9957710	44.3	8 51 51.68	
8	312	226 6 39.7	5 41.1	150.82	+0.01	.9956651	43.9	8 47 55.77	
9	313	227 7 0.4	6 1.7	150.88	0.12	.9955603	43.4	8 43 59.86	
10	314	228 7 22.4	6 23.5	150.94	0.21	.9954566	42.9	8 40 3.96	
11	315	229 7 45.8	6 46.7	151.00	0.28	.9953542	42.3	8 36 8.04	
12	316	230 8 10.5	7 11.3	151.06	0.38	.9952534	41.6	8 32 12.13	
13	317	231 8 36.6	7 37.3	151.12	0.34	.9951542	40.8	8 28 16.22	
14	318	232 9 4.2	8 4.7	151.18	0.31	.9950569	40.0	8 24 20.31	
15	319	233 9 33.2	8 33.5	151.24	0.26	.9949616	39.2	8 20 24.40	
16	320	234 10 3.5	9 3.6	151.30	0.18	.9948683	38.4	8 16 28.49	
17	321	235 10 35.4	9 35.4	151.36	+0.08	.9947772	37.5	8 12 32.58	
18	322	236 11 8.8	10 8.7	151.42	—0.04	.9946882	36.6	8 8 36.67	
19	323	237 11 43.7	10 43.4	151.48	0.17	.9946014	35.7	8 4 40.76	
20	324	238 12 20.2	11 19.7	151.55	0.31	.9945167	34.8	8 0 44.85	
21	325	239 12 58.2	11 57.5	151.62	0.44	.9944340	34.0	7 56 48.94	
22	326	240 13 37.9	12 37.1	151.69	0.57	.9943534	33.1	7 52 53.03	
23	327	241 14 19.2	13 18.3	151.76	0.69	.9942749	32.3	7 48 57.12	
24	328	242 15 2.1	14 1.0	151.83	0.79	.9941963	31.5	7 45 1.31	
25	329	243 15 46.6	14 45.3	151.90	0.86	.9941236	30.7	7 41 5.30	
26	330	244 16 32.8	15 31.3	151.96	0.90	.9940508	30.0	7 37 9.39	
27	331	245 17 20.5	16 18.9	152.02	0.91	.9939792	29.4	7 33 13.48	
28	332	246 18 9.6	17 7.9	152.08	0.89	.9939093	28.9	7 29 17.57	
29	333	247 19 0.2	17 58.3	152.14	0.83	.9938408	28.3	7 25 21.66	
30	334	248 19 52.1	18 50.1	152.19	0.75	.9937736	27.8	7 21 25.74	
31	335	249 20 45.3	19 43.0	152.24	—0.66	9.9937077	27.2	7 17 29.83	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h m	Diff. for 1 hour.	
1	16' 42.4	16' 45.1	61' 12.5	+1.01	61' 22.2	+0.61	23 26.9	2.50	28.2
2	16 46.4	16 46.3	61 27.0	+0.19	61 26.6	-0.25	6		29.2
3	16 44.8	16 41.9	61 21.1	-0.67	61 10.6	1.07	0 28.7	2.63	0.8
4	16 37.8	16 32.6	60 55.5	1.43	60 36.5	1.74	1 32.7	2.68	1.8
5	16 26.5	16 19.6	60 14.0	2.00	59 48.8	2.19	2 36.5	2.63	2.8
6	16 12.2	16 4.5	59 21.6	2.32	58 53.3	2.39	3 37.5	2.46	3.8
7	15 56.7	15 48.8	58 24.4	2.41	57 55.7	2.37	4 34.1	2.36	4.8
8	15 41.2	15 33.9	57 27.6	2.30	57 0.7	2.19	5 25.9	2.06	5.8
9	15 26.9	15 20.4	56 35.1	2.06	56 11.3	1.91	6 13.4	1.91	6.8
10	15 14.5	15 9.0	55 49.4	1.75	55 29.5	1.58	6 57.8	1.80	7.8
11	15 4.2	14 59.9	55 11.6	1.40	54 55.8	1.23	7 40.1	1.74	8.8
12	14 56.1	14 52.9	54 42.0	1.06	54 30.3	0.90	8 21.5	1.72	9.8
13	14 50.2	14 48.1	54 20.5	0.74	54 12.5	0.59	9 2.9	1.74	10.8
14	14 46.4	14 45.2	54 6.3	0.44	54 1.9	0.31	9 45.3	1.79	11.8
15	14 44.4	14 44.0	53 59.0	-0.18	53 57.6	-0.06	10 29.2	1.87	12.8
16	14 44.0	14 44.3	53 57.5	+0.05	53 58.8	+0.16	11 15.2	1.96	13.8
17	14 45.1	14 46.1	54 1.4	0.26	54 5.2	0.37	12 3.2	2.04	14.8
18	14 47.4	14 49.1	54 10.2	0.47	54 16.5	0.57	12 52.8	2.09	15.8
19	14 51.2	14 53.6	54 23.9	0.68	54 32.7	0.79	13 43.4	2.11	16.8
20	14 56.3	14 59.4	54 42.8	0.90	54 54.3	1.01	14 33.9	2.09	17.8
21	15 3.0	15 6.9	55 7.2	1.14	55 21.6	1.26	15 23.7	2.05	18.8
22	15 11.2	15 15.9	55 37.4	1.38	55 54.8	1.51	16 12.2	2.00	19.8
23	15 21.1	15 26.6	56 13.6	1.63	56 34.0	1.76	16 59.7	1.96	20.8
24	15 32.5	15 38.8	56 55.8	1.87	57 18.8	1.96	17 46.5	1.95	21.8
25	15 45.3	15 52.1	57 42.8	2.04	58 7.7	2.09	18 33.6	1.98	22.8
26	15 59.0	16 5.9	58 33.0	2.12	58 58.3	2.10	19 22.0	2.06	23.8
27	16 12.7	16 19.1	59 23.2	2.03	59 47.0	1.92	20 13.0	2.19	24.8
28	16 25.2	16 30.5	60 9.1	1.75	60 28.8	1.53	21 7.5	2.36	25.8
29	16 35.1	16 38.6	60 45.5	1.25	60 58.5	0.92	22 6.4	2.54	26.8
30	16 41.1	16 42.3	61 7.5	+0.56	61 11.9	+0.17	23 9.1	2.67	27.8
31	16 42.2	16 40.8	61 11.5	-0.23	61 6.4	-0.63	6		28.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	13 15 12.67	2.4393	S. 13° 13' 45.3"	13.467	0	15 18 25.74	2.6687	S. 21° 52' 30.6"	7.429
1	13 17 38.60	2.4802	13 27 10.9	13.397	1	15 21 7.05	2.6902	21 59 51.3	7.282
2	13 20 4.89	2.4411	13 40 31.7	13.306	2	15 23 48.57	2.6936	22 7 2.0	7.093
3	13 22 31.54	2.4471	13 53 47.5	13.222	3	15 26 30.29	2.6969	22 14 2.5	6.923
4	13 24 58.54	2.4891	14 6 58.3	13.126	4	15 29 12.20	2.7001	22 20 52.8	6.762
5	13 27 25.91	2.4691	14 20 3.9	13.048	5	15 31 54.30	2.7031	22 27 32.8	6.611
6	13 29 53.63	2.4650	14 33 4.1	12.986	6	15 34 36.57	2.7060	22 34 2.5	6.466
7	13 32 21.71	2.4710	14 45 58.8	12.866	7	15 37 19.02	2.7087	22 40 21.7	6.323
8	13 34 50.15	2.4770	14 58 48.0	12.772	8	15 40 1.62	2.7113	22 46 30.5	6.066
9	13 37 18.95	2.4830	15 11 31.5	12.676	9	15 42 44.37	2.7137	22 52 28.7	5.893
10	13 39 48.11	2.4891	15 24 9.1	12.577	10	15 45 27.27	2.7160	22 58 16.4	5.706
11	13 42 17.63	2.4951	15 36 40.8	12.477	11	15 48 10.30	2.7182	23 3 53.5	5.529
12	13 44 47.52	2.5011	15 49 6.4	12.376	12	15 50 53.45	2.7202	23 9 19.9	5.350
13	13 47 17.77	2.5071	16 1 25.8	12.271	13	15 53 36.72	2.7230	23 14 35.5	5.171
14	13 49 48.37	2.5130	16 13 38.9	12.164	14	15 56 20.09	2.7257	23 19 40.4	4.991
15	13 52 19.33	2.5189	16 25 45.5	12.056	15	15 59 3.56	2.7282	23 24 34.5	4.811
16	13 54 50.64	2.5248	16 37 45.6	11.946	16	16 1 47.11	2.7306	23 29 17.7	4.629
17	13 57 22.31	2.5306	16 49 39.0	11.833	17	16 4 30.75	2.7278	23 33 50.0	4.447
18	13 59 54.34	2.5367	17 1 25.6	11.718	18	16 7 14.45	2.7298	23 38 11.3	4.263
19	14 2 26.72	2.5426	17 13 5.2	11.602	19	16 9 58.21	2.7327	23 42 21.7	4.082
20	14 4 59.45	2.5485	17 24 37.8	11.483	20	16 12 42.01	2.7304	23 46 21.2	3.899
21	14 7 32.53	2.5543	17 36 3.2	11.363	21	16 15 25.85	2.7309	23 50 9.7	3.716
22	14 10 5.96	2.5601	17 47 21.3	11.240	22	16 18 9.72	2.7313	23 53 47.1	3.532
23	14 12 39.74	2.5658	S. 17° 58' 32.0"	11.116	23	16 20 53.61	2.7316	S. 23° 57' 13.5"	3.347
SATURDAY 2.					MONDAY 4.				
0	14 15 13.86	2.5716	S. 18° 9' 35.2"	10.989	0	16 23 37.50	2.7316	S. 24° 0' 28.8"	3.163
1	14 17 48.32	2.5772	18 20 30.7	10.861	1	16 26 21.39	2.7313	24 3 33.0	2.978
2	14 20 23.12	2.5828	18 31 18.5	10.731	2	16 29 5.26	2.7310	24 6 26.2	2.794
3	14 22 58.25	2.5883	18 41 58.4	10.599	3	16 31 49.11	2.7308	24 9 8.3	2.610
4	14 25 33.72	2.5938	18 52 30.4	10.464	4	16 34 32.93	2.7308	24 11 39.4	2.426
5	14 28 9.51	2.5992	19 2 54.2	10.328	5	16 37 16.70	2.7301	24 13 59.4	2.240
6	14 30 45.63	2.6045	19 13 9.8	10.191	6	16 40 0.42	2.7300	24 16 8.2	2.055
7	14 33 22.06	2.6098	19 23 17.1	10.052	7	16 42 44.07	2.7300	24 18 5.9	1.870
8	14 35 58.81	2.6151	19 33 16.0	9.910	8	16 45 27.64	2.7295	24 19 52.6	1.685
9	14 38 35.88	2.6203	19 43 6.4	9.767	9	16 48 11.13	2.7341	24 21 28.2	1.501
10	14 41 13.25	2.6254	19 52 48.1	9.622	10	16 50 54.53	2.7324	24 22 52.7	1.317
11	14 43 50.93	2.6304	20 2 21.1	9.476	11	16 53 37.82	2.7303	24 24 6.2	1.133
12	14 46 28.90	2.6353	20 11 45.2	9.328	12	16 56 20.99	2.7184	24 25 8.6	0.948
13	14 49 7.17	2.6402	20 21 0.4	9.178	13	16 59 4.03	2.7182	24 26 0.0	0.768
14	14 51 45.72	2.6449	20 30 6.6	9.026	14	17 1 46.94	2.7139	24 26 40.5	0.583
15	14 54 24.55	2.6495	20 39 3.6	8.873	15	17 4 29.70	2.7114	24 27 10.0	0.401
16	14 57 3.66	2.6541	20 47 51.4	8.719	16	17 7 12.31	2.7087	24 27 28.6	0.219
17	14 59 43.04	2.6586	20 56 29.9	8.563	17	17 9 54.75	2.7060	24 27 36.3	0.036
18	15 2 22.69	2.6629	21 4 58.9	8.405	18	17 12 37.02	2.7029	24 27 33.2	0.143
19	15 5 2.59	2.6671	21 13 18.4	8.246	19	17 15 19.10	2.6997	24 27 19.2	0.322
20	15 7 42.74	2.6713	21 21 28.4	8.083	20	17 18 0.98	2.6963	24 26 54.5	0.502
21	15 10 23.14	2.6753	21 29 28.7	7.923	21	17 20 42.66	2.6928	24 26 19.0	0.681
22	15 13 3.78	2.6792	21 37 19.2	7.760	22	17 23 24.12	2.6892	24 25 32.8	0.860
23	15 15 44.65	2.6830	21 44 59.9	7.599	23	17 26 5.37	2.6855	24 24 35.9	1.036
24	15 18 25.74	2.6867	S. 21° 52' 30.6"	7.429	24	17 28 46.38	2.6816	S. 24° 23' 28.5"	1.212

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	17 28 46.38	2.6916	S. 24° 23' 28.5"	1.312	0	19 30 46.34	2.3731	S. 20° 24' 45.9"	8.186
1	17 31 27.15	2.6774	24 22 10.5	1.388	1	19 33 8.50	2.3658	20 16 31.6	8.293
2	17 34 7.67	2.6731	24 20 42.0	1.463	2	19 35 30.20	2.3579	20 8 10.8	8.400
3	17 36 47.93	2.6687	24 19 3.0	1.736	3	19 37 51.45	2.3508	19 59 43.6	8.506
4	17 39 27.92	2.6643	24 17 13.7	1.909	4	19 40 12.24	2.3437	19 51 10.2	8.606
5	17 42 7.64	2.6606	24 15 14.0	2.081	5	19 42 32.58	2.3368	19 42 30.6	8.710
6	17 44 47.07	2.6546	24 13 4.0	2.261	6	19 44 52.46	2.3376	19 33 45.0	8.810
7	17 47 26.31	2.6489	24 10 43.9	2.430	7	19 47 11.89	2.3301	19 24 53.4	8.908
8	17 50 5.06	2.6449	24 8 13.6	2.588	8	19 49 30.87	2.3126	19 15 56.0	9.006
9	17 52 43.60	2.6397	24 5 33.2	2.756	9	19 51 49.39	2.3050	19 6 52.7	9.102
10	17 55 21.82	2.6344	24 2 42.9	2.923	10	19 54 7.47	2.2976	18 57 43.8	9.196
11	17 57 59.72	2.6289	23 59 42.6	3.087	11	19 56 25.10	2.2901	18 48 29.3	9.288
12	18 0 37.29	2.6233	23 56 32.5	3.261	12	19 58 42.28	2.2826	18 39 9.3	9.379
13	18 3 14.52	2.6177	23 53 12.6	3.413	13	20 0 59.01	2.2762	18 29 43.9	9.466
14	18 5 51.41	2.6120	23 49 42.9	3.574	14	20 3 15.20	2.2678	18 20 13.1	9.546
15	18 8 27.95	2.6061	23 46 3.6	3.734	15	20 5 31.15	2.2605	18 10 37.1	9.643
16	18 11 4.14	2.6000	23 42 14.8	3.898	16	20 7 46.56	2.2532	18 0 55.9	9.738
17	18 13 39.96	2.5939	23 38 16.4	4.061	17	20 10 1.53	2.2469	17 51 9.7	9.811
18	18 16 15.41	2.5877	23 34 8.7	4.207	18	20 12 16.07	2.2386	17 41 18.7	9.893
19	18 18 50.49	2.5815	23 29 51.7	4.361	19	20 14 30.17	2.2314	17 31 22.5	9.974
20	18 21 25.19	2.5751	23 25 25.4	4.514	20	20 16 43.84	2.2243	17 21 21.7	10.063
21	18 23 59.50	2.5687	23 20 50.0	4.668	21	20 18 57.06	2.2173	17 11 16.2	10.151
22	18 26 33.43	2.5623	23 16 5.5	4.817	22	20 21 9.90	2.2101	17 1 6.0	10.207
23	18 29 6.96	2.5556	S. 23° 11' 12.0"	4.968	23	20 23 22.29	2.2030	S. 16° 50' 51.3"	10.268
WEDNESDAY 6.					FRIDAY 8.				
0	18 31 40.10	2.5489	S. 23° 6' 9.6"	5.113	0	20 25 34.26	2.1980	S. 16° 40' 32.1"	10.266
1	18 34 12.83	2.5431	23 0 58.4	5.269	1	20 27 45.81	2.1891	16 30 8.6	10.437
2	18 36 45.15	2.5373	22 55 38.5	5.403	2	20 29 56.95	2.1822	16 19 40.8	10.496
3	18 39 17.05	2.5313	22 50 10.0	5.546	3	20 32 7.68	2.1754	16 9 8.8	10.567
4	18 41 48.54	2.5253	22 44 33.0	5.687	4	20 34 18.00	2.1686	15 58 32.8	10.633
5	18 44 19.60	2.5193	22 38 47.5	5.827	5	20 36 27.92	2.1619	15 47 52.7	10.701
6	18 46 50.24	2.5131	22 32 53.7	5.965	6	20 38 37.43	2.1553	15 37 8.6	10.767
7	18 49 20.45	2.5069	22 26 51.7	6.102	7	20 40 46.55	2.1487	15 26 20.7	10.831
8	18 51 50.24	2.4996	22 20 41.5	6.237	8	20 42 55.27	2.1421	15 15 29.0	10.893
9	18 54 19.59	2.4933	22 14 23.2	6.371	9	20 45 3.60	2.1356	15 4 33.6	10.964
10	18 56 48.50	2.4783	22 7 57.0	6.503	10	20 47 11.54	2.1292	14 53 34.5	11.014
11	18 59 16.98	2.4709	22 1 22.8	6.634	11	20 49 19.10	2.1228	14 42 31.8	11.073
12	19 1 45.01	2.4635	21 54 40.9	6.763	12	20 51 26.27	2.1166	14 31 25.7	11.131
13	19 4 12.60	2.4561	21 47 51.3	6.890	13	20 53 33.07	2.1102	14 20 16.2	11.177
14	19 6 39.74	2.4487	21 40 54.1	7.016	14	20 55 39.49	2.1040	14 9 3.3	11.243
15	19 9 6.44	2.4413	21 33 49.4	7.140	15	20 57 45.54	2.0978	13 57 47.2	11.296
16	19 11 32.69	2.4338	21 26 37.3	7.262	16	20 59 51.23	2.0917	13 46 27.9	11.347
17	19 13 58.49	2.4263	21 19 18.0	7.383	17	21 1 56.55	2.0857	13 35 5.5	11.398
18	19 16 23.83	2.4188	21 11 51.4	7.503	18	21 4 1.51	2.0796	13 23 40.1	11.448
19	19 18 48.72	2.4110	21 4 17.7	7.620	19	21 6 6.12	2.0739	13 12 11.7	11.497
20	19 21 13.15	2.4034	20 56 37.0	7.736	20	21 8 10.38	2.0681	13 0 40.4	11.546
21	19 23 37.13	2.3958	20 48 49.4	7.851	21	21 10 14.29	2.0623	12 49 6.3	11.592
22	19 26 0.65	2.3883	20 40 54.9	7.964	22	21 12 17.86	2.0567	12 37 29.4	11.638
23	19 28 23.72	2.3807	20 32 53.7	8.075	23	21 14 21.09	2.0511	12 25 49.8	11.683
24	19 30 46.34	2.3731	S. 20° 24' 45.9"	8.186	24	21 16 23.99	2.0456	S. 12° 14' 7.6"	11.728

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	^h 21 ^m 16 ^s 23.99	2.0456	S. 12° 14' 7.6"	11.736	0	^h 22 ^m 49 ^s 34.52	1.8649	S. 2° 20' 49.2"	12.688
1	21 18 26.56	2.0401	12 2 22.8	11.767	1	22 51 26.35	1.8629	2 8 10.1	12.682
2	21 20 28.80	2.0347	11 50 35.6	11.808	2	22 53 18.07	1.8610	1 55 31.0	12.680
3	21 22 30.72	2.0293	11 38 45.9	11.847	3	22 55 9.67	1.8591	1 42 52.1	12.648
4	21 24 32.32	2.0240	11 26 53.9	11.886	4	22 57 1.16	1.8574	1 30 13.3	12.644
5	21 26 33.60	2.0188	11 14 59.7	11.923	5	22 58 52.55	1.8557	1 17 34.8	12.640
6	21 28 34.58	2.0137	11 3 3.2	11.960	6	23 0 43.84	1.8540	1 4 56.5	12.636
7	21 30 35.25	2.0087	10 51 4.5	11.995	7	23 2 35.03	1.8524	0 52 18.6	12.632
8	21 32 35.62	2.0037	10 39 3.8	12.029	8	23 4 26.13	1.8509	0 39 41.0	12.628
9	21 34 35.70	1.9988	10 27 1.0	12.063	9	23 6 17.14	1.8494	0 27 3.8	12.615
10	21 36 35.48	1.9940	10 14 56.3	12.096	10	23 8 8.07	1.8481	0 14 27.1	12.609
11	21 38 34.98	1.9893	10 2 49.6	12.127	11	23 9 58.92	1.8468	S. 0 1 50.8	12.601
12	21 40 34.19	1.9848	9 50 41.1	12.157	12	23 11 49.69	1.8456	N. 0 10 45.0	12.593
13	21 42 33.12	1.9799	9 38 30.8	12.186	13	23 13 40.39	1.8445	0 23 20.2	12.588
14	21 44 31.78	1.9754	9 26 18.8	12.214	14	23 15 31.03	1.8434	0 35 54.8	12.573
15	21 46 30.17	1.9710	9 14 5.1	12.242	15	23 17 21.60	1.8423	0 48 28.8	12.561
16	21 48 28.30	1.9666	9 1 49.8	12.269	16	23 19 12.11	1.8414	1 1 2.1	12.549
17	21 50 26.16	1.9623	8 49 32.9	12.294	17	23 21 2.57	1.8406	1 13 34.7	12.537
18	21 52 23.77	1.9580	8 37 14.5	12.318	18	23 22 52.98	1.8397	1 26 6.5	12.523
19	21 54 21.12	1.9538	8 24 54.7	12.342	19	23 24 43.34	1.8389	1 38 37.5	12.509
20	21 56 18.23	1.9497	8 12 33.5	12.364	20	23 26 33.65	1.8382	1 51 7.6	12.495
21	21 58 15.09	1.9457	8 0 11.0	12.386	21	23 28 23.92	1.8376	2 3 36.9	12.480
22	22 0 11.72	1.9418	7 47 47.2	12.407	22	23 30 14.16	1.8370	2 16 5.2	12.464
23	22 2 8.11	1.9379	S. 7° 35' 22.2"	12.427	23	23 32 4.36	1.8365	N. 2 28 32.6	12.448
SUNDAY 10.					TUESDAY 12.				
0	22 4 4.27	1.9341	S. 7° 22' 56.0"	12.446	0	23 33 54.54	1.8361	N. 2 40 58.9	12.431
1	22 6 0.21	1.9304	7 10 28.7	12.464	1	23 35 44.69	1.8357	2 53 24.2	12.412
2	22 7 55.92	1.9268	6 58 0.3	12.481	2	23 37 34.62	1.8354	3 5 48.5	12.394
3	22 9 51.42	1.9232	6 45 30.9	12.497	3	23 39 24.94	1.8350	3 18 11.6	12.375
4	22 11 46.70	1.9197	6 33 0.6	12.512	4	23 41 15.04	1.8346	3 30 33.5	12.355
5	22 13 41.78	1.9162	6 20 29.4	12.527	5	23 43 5.13	1.8342	3 42 54.2	12.334
6	22 15 36.65	1.9126	6 7 57.3	12.541	6	23 44 55.22	1.8340	3 55 13.6	12.313
7	22 17 31.32	1.9090	5 55 24.4	12.555	7	23 46 45.31	1.8348	4 7 31.8	12.292
8	22 19 25.80	1.9054	5 42 50.7	12.567	8	23 48 35.40	1.8349	4 19 48.6	12.269
9	22 21 20.09	1.9028	5 30 16.3	12.578	9	23 50 25.50	1.8350	4 32 4.1	12.246
10	22 23 14.19	1.9002	5 17 41.3	12.588	10	23 52 15.60	1.8351	4 44 18.1	12.223
11	22 25 8.11	1.8975	5 5 5.7	12.598	11	23 54 5.71	1.8353	4 56 30.7	12.199
12	22 27 1.85	1.8948	4 52 29.5	12.607	12	23 55 55.84	1.8355	5 8 41.9	12.173
13	22 28 55.42	1.8914	4 39 52.8	12.616	13	23 57 45.99	1.8359	5 20 51.5	12.147
14	22 30 48.62	1.8886	4 27 15.7	12.623	14	23 59 36.16	1.8365	5 32 59.5	12.120
15	22 32 42.05	1.8860	4 14 38.1	12.629	15	0 1 26.36	1.8370	5 45 5.9	12.093
16	22 34 35.13	1.8838	4 2 0.2	12.634	16	0 3 16.60	1.8376	5 57 10.7	12.064
17	22 36 28.05	1.8808	3 49 22.0	12.639	17	0 5 6.87	1.8382	6 9 13.8	12.037
18	22 38 20.82	1.8768	3 36 43.5	12.643	18	0 6 57.18	1.8388	6 21 15.1	12.009
19	22 40 13.45	1.8730	3 24 4.7	12.647	19	0 8 47.53	1.8395	6 33 14.7	11.979
20	22 42 5.93	1.8706	3 11 25.8	12.650	20	0 10 37.92	1.8403	6 45 12.5	11.948
21	22 43 58.27	1.8713	2 58 46.7	12.653	21	0 12 28.36	1.8411	6 57 8.4	11.917
22	22 45 50.48	1.8691	2 46 7.6	12.653	22	0 14 18.85	1.8420	7 9 2.5	11.886
23	22 47 42.56	1.8670	2 33 28.4	12.653	23	0 16 9.40	1.8429	7 20 54.6	11.852
24	22 49 34.52	1.8649	S. 2° 20' 49.2"	12.653	24	0 18 0.00	1.8439	N. 7 32 44.7	11.819

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	0 18 0.00	1.8438	N. 7° 32' 44.7"	11.819	0	1 48 34.71	1.8463	N. 16° 8' 57.8"	9.422
1	0 19 50.66	1.8449	7 44 32.8	11.785	1	1 50 31.57	1.8492	16 18 21.1	9.385
2	0 21 41.39	1.8460	7 56 18.9	11.781	2	1 52 28.62	1.8523	16 27 40.4	9.287
3	0 23 32.18	1.8473	8 8 2.9	11.716	3	1 54 25.85	1.8554	16 36 55.5	9.218
4	0 25 23.05	1.8484	8 19 44.8	11.680	4	1 56 23.27	1.8585	16 46 6.5	9.148
5	0 27 13.99	1.8497	8 31 24.5	11.643	5	1 58 20.87	1.8616	16 55 13.3	9.078
6	0 29 5.01	1.8510	8 43 2.0	11.606	6	2 0 18.66	1.8647	17 4 15.9	9.007
7	0 30 56.11	1.8522	8 54 37.3	11.569	7	2 2 16.64	1.8678	17 13 14.2	8.935
8	0 32 47.29	1.8537	9 6 10.3	11.530	8	2 4 14.80	1.8710	17 22 8.1	8.863
9	0 34 38.56	1.8552	9 17 40.9	11.491	9	2 6 13.16	1.8743	17 30 57.7	8.790
10	0 36 29.92	1.8567	9 29 9.2	11.451	10	2 8 11.71	1.8774	17 39 42.9	8.716
11	0 38 21.37	1.8583	9 40 35.0	11.410	11	2 10 10.45	1.8806	17 48 23.6	8.643
12	0 40 12.92	1.8599	9 51 58.4	11.369	12	2 12 9.38	1.8838	17 56 59.9	8.568
13	0 42 4.57	1.8617	10 3 19.3	11.327	13	2 14 8.51	1.8871	18 5 31.6	8.490
14	0 43 56.32	1.8634	10 14 37.7	11.284	14	2 16 7.83	1.8903	18 13 58.7	8.413
15	0 45 48.17	1.8651	10 25 53.5	11.243	15	2 18 7.35	1.8936	18 22 21.2	8.336
16	0 47 40.13	1.8669	10 37 6.7	11.198	16	2 20 7.06	1.8969	18 30 39.0	8.257
17	0 49 32.20	1.8687	10 48 17.2	11.153	17	2 22 6.97	2.0003	18 38 52.1	8.178
18	0 51 24.38	1.8706	10 59 25.1	11.108	18	2 24 7.08	2.0035	18 47 0.4	8.098
19	0 53 16.68	1.8726	11 10 30.2	11.063	19	2 26 7.39	2.0068	18 55 3.9	8.018
20	0 55 9.09	1.8746	11 21 32.5	11.016	20	2 28 7.90	2.0101	19 3 2.6	7.937
21	0 57 1.63	1.8767	11 32 32.0	10.968	21	2 30 8.61	2.0134	19 10 56.4	7.854
22	0 58 54.29	1.8787	11 43 28.6	10.920	22	2 32 9.52	2.0166	19 18 45.3	7.773
23	1 0 47.08	1.8808	N. 11° 54' 22.3"	10.871	23	2 34 10.63	2.0201	N. 19° 26' 29.2"	7.690
THURSDAY 14.					SATURDAY 16.				
0	1 2 39.99	1.8830	N. 12° 5' 13.1"	10.821	0	2 36 11.93	2.0235	N. 19° 34' 8.1"	7.606
1	1 4 33.04	1.8852	12 16 0.9	10.771	1	2 38 13.44	2.0268	19 41 41.9	7.521
2	1 6 26.22	1.8874	12 26 45.6	10.720	2	2 40 15.15	2.0301	19 49 10.6	7.436
3	1 8 19.54	1.8897	12 37 27.3	10.669	3	2 42 17.06	2.0334	19 56 34.2	7.350
4	1 10 12.99	1.8921	12 48 5.9	10.616	4	2 44 19.16	2.0368	20 3 52.6	7.263
5	1 12 6.59	1.8945	12 58 41.3	10.563	5	2 46 21.47	2.0401	20 11 5.8	7.176
6	1 14 0.33	1.8969	13 9 13.5	10.509	6	2 48 23.97	2.0434	20 18 13.7	7.087
7	1 15 54.22	1.8994	13 19 42.4	10.455	7	2 50 26.67	2.0467	20 25 16.3	6.998
8	1 17 48.26	1.9019	13 30 8.1	10.400	8	2 52 29.57	2.0500	20 32 13.5	6.909
9	1 19 42.45	1.9044	13 40 30.5	10.345	9	2 54 32.67	2.0533	20 39 5.4	6.819
10	1 21 36.79	1.9069	13 50 49.5	10.288	10	2 56 35.97	2.0566	20 45 51.8	6.730
11	1 23 31.28	1.9095	14 1 5.1	10.231	11	2 58 39.47	2.0599	20 52 32.7	6.638
12	1 25 25.93	1.9121	14 11 17.2	10.173	12	3 0 43.16	2.0632	20 59 8.1	6.544
13	1 27 20.74	1.9148	14 21 25.9	10.116	13	3 2 47.05	2.0664	21 5 37.9	6.451
14	1 29 15.71	1.9175	14 31 31.0	10.058	14	3 4 51.13	2.0697	21 12 2.2	6.357
15	1 31 10.85	1.9203	14 41 32.5	9.999	15	3 6 55.41	2.0730	21 18 20.8	6.263
16	1 33 6.15	1.9230	14 51 30.4	9.944	16	3 8 59.88	2.0761	21 24 33.7	6.168
17	1 35 1.62	1.9258	15 1 24.6	9.873	17	3 11 4.54	2.0793	21 30 40.9	6.073
18	1 36 57.25	1.9287	15 11 15.1	9.810	18	3 13 9.40	2.0826	21 36 42.3	5.976
19	1 38 53.06	1.9316	15 21 1.8	9.748	19	3 15 14.45	2.0857	21 42 38.0	5.879
20	1 40 49.04	1.9344	15 30 44.8	9.684	20	3 17 19.68	2.0889	21 48 27.8	5.781
21	1 42 45.19	1.9373	15 40 23.9	9.620	21	3 19 25.11	2.0920	21 54 11.7	5.682
22	1 44 41.52	1.9402	15 49 59.2	9.554	22	3 21 30.72	2.0951	21 59 49.7	5.583
23	1 46 38.03	1.9432	15 59 30.5	9.488	23	3 23 36.51	2.0981	22 5 21.7	5.484
24	1 48 34.71	1.9463	N. 16° 8' 57.8"	9.423	24	3 25 42.49	2.1012	N. 22° 10' 47.8"	5.384

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 25 42.49	2.1012	N.22° 10' 47.8"	5.384	0	5 9 22.21	2.1907	N.24° 24' 3.3"	0.014
1	3 27 48.65	2.1043	22 16 7.8	5.283	1	5 11 34.21	2.2004	24 24 0.6	0.166
2	3 29 54.99	2.1072	22 21 21.8	5.182	2	5 13 46.26	2.2011	24 23 50.7	0.225
3	3 32 1.51	2.1102	22 26 29.7	5.081	3	5 15 58.35	2.2017	24 23 33.6	0.245
4	3 34 8.21	2.1131	22 31 31.5	4.978	4	5 18 10.47	2.2028	24 23 9.3	0.466
5	3 36 15.08	2.1160	22 36 27.1	4.874	5	5 20 22.63	2.2028	24 22 37.8	0.505
6	3 38 22.13	2.1189	22 41 16.4	4.771	6	5 22 34.81	2.2033	24 21 59.1	0.704
7	3 40 29.35	2.1217	22 45 59.5	4.667	7	5 24 47.02	2.2037	24 21 13.2	0.834
8	3 42 36.74	2.1245	22 50 36.4	4.562	8	5 26 59.26	2.2040	24 20 20.2	0.944
9	3 44 44.30	2.1273	22 55 7.0	4.457	9	5 29 11.51	2.2043	24 19 20.0	1.064
10	3 46 52.02	2.1301	22 59 31.2	4.351	10	5 31 23.77	2.2046	24 18 12.5	1.164
11	3 48 59.91	2.1329	23 3 49.1	4.244	11	5 33 36.05	2.2047	24 16 57.9	1.304
12	3 51 7.96	2.1356	23 8 0.5	4.137	12	5 35 48.33	2.2048	24 15 36.0	1.434
13	3 53 16.17	2.1382	23 12 5.5	4.029	13	5 38 0.62	2.2048	24 14 6.9	1.545
14	3 55 24.54	2.1408	23 16 4.0	3.921	14	5 40 12.91	2.2048	24 12 30.6	1.685
15	3 57 33.06	2.1433	23 19 56.1	3.813	15	5 42 25.19	2.2047	24 10 47.1	1.784
16	3 59 41.73	2.1458	23 23 41.6	3.704	16	5 44 37.47	2.2046	24 8 56.5	1.904
17	4 1 50.55	2.1482	23 27 20.6	3.595	17	5 46 49.74	2.2044	24 6 58.6	2.034
18	4 3 59.52	2.1506	23 30 53.0	3.486	18	5 49 2.00	2.2043	24 4 53.6	2.144
19	4 6 8.63	2.1530	23 34 18.8	3.374	19	5 51 14.24	2.2039	24 2 41.4	2.263
20	4 8 17.88	2.1554	23 37 37.9	3.263	20	5 53 26.47	2.2038	24 0 22.0	2.383
21	4 10 27.27	2.1577	23 40 50.3	3.153	21	5 55 38.67	2.2031	23 57 55.4	2.503
22	4 12 36.80	2.1599	23 43 56.1	3.040	22	5 57 50.84	2.2028	23 55 21.7	2.621
23	4 14 46.46	2.1621	N.23 46 55.1	2.928	23	6 0 2.98	2.2021	N.23 52 40.9	2.740
MONDAY 18.					WEDNESDAY 20.				
0	4 16 56.25	2.1643	N.23 49 47.4	2.815	0	6 2 15.09	2.2015	N.23 49 52.9	2.860
1	4 19 6.17	2.1663	23 52 32.9	2.702	1	6 4 27.16	2.2008	23 46 57.8	2.976
2	4 21 16.21	2.1684	23 55 11.6	2.589	2	6 6 39.19	2.2009	23 43 55.6	3.097
3	4 23 26.38	2.1704	23 57 43.5	2.476	3	6 8 51.18	2.1995	23 40 46.2	3.215
4	4 25 36.66	2.1724	24 0 8.6	2.361	4	6 11 3.13	2.1987	23 37 29.8	3.333
5	4 27 47.06	2.1743	24 2 26.8	2.246	5	6 13 15.03	2.1978	23 34 6.3	3.451
6	4 29 57.58	2.1761	24 4 38.1	2.131	6	6 15 26.87	2.1970	23 30 35.7	3.569
7	4 32 8.20	2.1779	24 6 42.5	2.016	7	6 17 38.66	2.1961	23 26 58.0	3.687
8	4 34 18.93	2.1796	24 8 40.0	1.900	8	6 19 50.40	2.1951	23 23 13.3	3.804
9	4 36 29.76	2.1813	24 10 30.5	1.784	9	6 22 2.08	2.1941	23 19 21.6	3.920
10	4 38 40.69	2.1829	24 12 14.1	1.668	10	6 24 13.69	2.1930	23 15 22.9	4.037
11	4 40 51.71	2.1845	24 13 50.7	1.551	11	6 26 25.24	2.1919	23 11 17.2	4.153
12	4 43 2.83	2.1860	24 15 20.2	1.434	12	6 28 36.72	2.1908	23 7 4.5	4.269
13	4 45 14.04	2.1875	24 16 42.7	1.317	13	6 30 48.13	2.1896	23 2 44.9	4.385
14	4 47 25.33	2.1889	24 17 58.2	1.200	14	6 32 59.47	2.1884	22 58 18.3	4.501
15	4 49 33.71	2.1902	24 19 6.7	1.083	15	6 35 10.73	2.1871	22 53 44.8	4.616
16	4 51 48.16	2.1915	24 20 8.1	0.964	16	6 37 21.92	2.1857	22 49 4.4	4.731
17	4 53 59.69	2.1927	24 21 2.4	0.846	17	6 39 33.02	2.1843	22 44 17.1	4.845
18	4 56 11.29	2.1939	24 21 49.6	0.730	18	6 41 44.04	2.1830	22 39 23.0	4.959
19	4 58 22.96	2.1950	24 22 29.7	0.609	19	6 43 54.98	2.1816	22 34 22.9	5.073
20	5 0 34.69	2.1961	24 23 2.7	0.491	20	6 46 5.83	2.1801	22 29 14.2	5.186
21	5 2 46.49	2.1971	24 23 28.6	0.372	21	6 48 16.59	2.1786	22 23 59.6	5.299
22	5 4 58.34	2.1980	24 23 47.3	0.253	22	6 50 27.26	2.1771	22 18 38.3	5.411
23	5 7 10.25	2.1989	24 23 58.9	0.133	23	6 52 37.84	2.1756	22 13 10.3	5.523
24	5 9 22.21	2.1997	N.24 24 3.3	0.014	24	6 54 48.33	2.1740	N.22 7 35.5	5.635

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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THURSDAY 21.

0	6 54 48.33	2.1748	N.22° 7' 35.5"	5.885
1	6 56 58.72	2.1728	22 1 54.0	5.747
2	6 59 9.01	2.1708	21 56 5.9	5.808
3	7 1 19.20	2.1689	21 50 11.2	5.908
4	7 3 29.28	2.1673	21 44 9.8	6.078
5	7 5 39.26	2.1658	21 38 1.8	6.187
6	7 7 49.14	2.1638	21 31 47.3	6.290
7	7 9 58.91	2.1620	21 25 26.3	6.404
8	7 12 8.58	2.1603	21 18 58.8	6.512
9	7 14 18.14	2.1584	21 12 24.8	6.620
10	7 16 27.59	2.1568	21 5 44.4	6.727
11	7 18 36.93	2.1547	20 58 57.5	6.834
12	7 20 46.16	2.1529	20 52 4.3	6.940
13	7 22 55.28	2.1510	20 45 4.7	7.046
14	7 25 4.28	2.1491	20 37 58.8	7.151
15	7 27 13.17	2.1473	20 30 46.6	7.255
16	7 29 21.94	2.1458	20 23 28.2	7.359
17	7 31 30.59	2.1433	20 16 3.5	7.463
18	7 33 39.13	2.1414	20 8 32.7	7.565
19	7 35 47.55	2.1394	20 0 55.7	7.668
20	7 37 55.86	2.1376	19 53 12.6	7.770
21	7 40 4.05	2.1356	19 45 23.4	7.871
22	7 42 12.12	2.1336	19 37 28.1	7.971
23	7 44 20.07	2.1316	N.19 29 26.8	8.071

SATURDAY 23.

0	8 37 1.47	2.0860	N.15° 38' 8.9"	10.364
1	8 39 6.52	2.0884	15 27 44.5	10.447
2	8 41 11.48	2.0918	15 17 15.2	10.530
3	8 43 16.34	2.0902	15 6 40.9	10.612
4	8 45 21.11	2.0787	14 56 1.8	10.693
5	8 47 25.79	2.0773	14 45 17.8	10.773
6	8 49 30.38	2.0768	14 34 29.0	10.852
7	8 51 34.89	2.0744	14 23 35.5	10.931
8	8 53 39.31	2.0730	14 12 37.3	11.009
9	8 55 43.65	2.0717	14 1 34.5	11.086
10	8 57 47.91	2.0703	13 50 27.0	11.162
11	8 59 52.09	2.0690	13 39 15.0	11.238
12	9 1 56.19	2.0678	13 27 58.4	11.313
13	9 4 0.22	2.0666	13 16 37.4	11.387
14	9 6 4.18	2.0654	13 5 11.9	11.460
15	9 8 8.07	2.0643	12 53 42.1	11.533
16	9 10 11.90	2.0632	12 42 7.9	11.605
17	9 12 15.66	2.0622	12 30 29.4	11.677
18	9 14 19.36	2.0612	12 18 46.7	11.747
19	9 16 23.01	2.0603	12 6 59.8	11.817
20	9 18 26.60	2.0594	11 55 8.7	11.886
21	9 20 30.14	2.0586	11 43 13.5	11.954
22	9 22 33.63	2.0578	11 31 14.2	12.021
23	9 24 37.07	2.0570	N.11 19 10.9	12.086

FRIDAY 22.

0	7 46 27.91	2.1297	N.19° 21' 19.6"	8.170
1	7 48 35.63	2.1277	19 13 6.4	8.269
2	7 50 43.23	2.1257	19 4 47.3	8.367
3	7 52 50.71	2.1237	18 56 22.4	8.464
4	7 54 58.07	2.1217	18 47 51.6	8.561
5	7 57 5.31	2.1197	18 39 15.0	8.657
6	7 59 12.44	2.1177	18 30 32.7	8.753
7	8 1 19.45	2.1156	18 21 44.6	8.849
8	8 3 26.34	2.1136	18 12 50.8	8.944
9	8 5 33.12	2.1116	18 3 51.4	9.038
10	8 7 39.78	2.1101	17 54 46.3	9.131
11	8 9 46.33	2.1083	17 45 35.7	9.223
12	8 11 52.76	2.1068	17 36 19.6	9.315
13	8 13 59.08	2.1044	17 26 58.0	9.406
14	8 16 5.29	2.1025	17 17 30.9	9.497
15	8 18 11.39	2.1007	17 7 58.4	9.587
16	8 20 17.38	2.0989	16 58 20.5	9.676
17	8 22 23.26	2.0971	16 48 37.2	9.765
18	8 24 29.03	2.0953	16 38 48.7	9.852
19	8 26 34.70	2.0936	16 28 55.0	9.939
20	8 28 40.26	2.0918	16 18 56.0	10.026
21	8 30 45.72	2.0901	16 8 51.9	10.112
22	8 32 51.07	2.0884	15 58 42.6	10.197
23	8 34 56.32	2.0867	15 48 28.3	10.281
24	8 37 1.47	2.0850	N.15 38 8.9	10.364

SUNDAY 24.

0	9 26 40.47	2.0663	N.11° 7' 3.6"	12.158
1	9 28 43.33	2.0667	10 54 52.4	12.218
2	9 30 47.15	2.0661	10 42 37.4	12.282
3	9 32 50.44	2.0646	10 30 18.5	12.346
4	9 34 53.69	2.0640	10 17 55.9	12.406
5	9 36 56.92	2.0636	10 5 29.5	12.470
6	9 39 0.12	2.0632	9 52 59.5	12.530
7	9 41 3.90	2.0628	9 40 25.9	12.590
8	9 43 6.46	2.0625	9 27 48.7	12.649
9	9 45 9.61	2.0623	9 15 7.9	12.706
10	9 47 12.74	2.0622	9 2 23.7	12.765
11	9 49 15.87	2.0622	8 49 36.0	12.822
12	9 51 19.00	2.0621	8 36 45.0	12.879
13	9 53 22.12	2.0621	8 23 50.6	12.933
14	9 55 25.25	2.0622	8 10 53.0	12.987
15	9 57 28.39	2.0623	7 57 52.2	13.040
16	9 59 31.53	2.0625	7 44 48.2	13.093
17	10 1 34.69	2.0627	7 31 41.1	13.145
18	10 3 37.86	2.0630	7 18 31.0	13.194
19	10 5 41.05	2.0634	7 5 17.8	13.244
20	10 7 44.27	2.0639	6 52 1.7	13.293
21	10 9 47.52	2.0644	6 38 42.7	13.341
22	10 11 50.80	2.0650	6 25 20.8	13.387
23	10 13 54.11	2.0656	6 11 50.2	13.433
24	10 15 57.47	2.0663	N. 5 58 28.8	13.478

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	^h 10 ^m 15 ^s 57.47	2.0883	N. 5 58 28.8	13.478	0	^h 11 56 50.61	2.1761	S. 5 20 38.8	14.371
1	10 18 0.87	2.0871	5 44 58.7	13.523	1	11 59 1.31	2.1805	5 35 0.7	14.380
2	10 20 4.32	2.0860	5 31 26.1	13.568	2	12 1 12.27	2.1849	5 49 21.9	14.345
3	10 22 7.83	2.0869	5 17 50.9	13.608	3	12 3 23.50	2.1894	6 3 42.2	14.330
4	10 24 11.39	2.0869	5 4 13.1	13.649	4	12 5 35.00	2.1940	6 18 1.5	14.313
5	10 26 15.01	2.0869	4 50 32.9	13.689	5	12 7 46.78	2.1987	6 32 19.8	14.288
6	10 28 18.70	2.0860	4 36 50.4	13.728	6	12 9 58.85	2.2034	6 46 36.9	14.273
7	10 30 22.45	2.0832	4 23 5.5	13.767	7	12 12 11.20	2.2082	7 0 52.8	14.264
8	10 32 26.28	2.0845	4 9 18.4	13.804	8	12 14 23.84	2.2131	7 15 7.4	14.251
9	10 34 30.18	2.0856	3 55 29.0	13.841	9	12 16 36.78	2.2181	7 29 20.5	14.208
10	10 36 34.17	2.0872	3 41 37.5	13.878	10	12 18 50.01	2.2231	7 43 32.1	14.188
11	10 38 38.25	2.0887	3 27 43.9	13.910	11	12 21 3.55	2.2282	7 57 42.1	14.158
12	10 40 42.41	2.0702	3 13 48.3	13.943	12	12 23 17.40	2.2334	8 11 50.4	14.123
13	10 42 46.67	2.0718	2 59 50.7	13.976	13	12 25 31.56	2.2387	8 25 56.9	14.092
14	10 44 51.03	2.0735	2 45 51.2	14.007	14	12 27 46.04	2.2440	8 40 1.5	14.058
15	10 46 55.49	2.0752	2 31 49.9	14.037	15	12 30 0.83	2.2498	8 54 4.0	14.025
16	10 49 0.06	2.0771	2 17 46.8	14.066	16	12 32 15.95	2.2547	9 8 4.5	13.989
17	10 51 4.75	2.0791	2 3 42.0	14.094	17	12 34 31.39	2.2602	9 22 2.8	13.952
18	10 53 9.55	2.0811	1 49 35.5	14.121	18	12 36 47.17	2.2657	9 35 58.8	13.913
19	10 55 14.47	2.0831	1 35 27.4	14.147	19	12 39 3.28	2.2713	9 49 52.4	13.873
20	10 57 19.52	2.0853	1 21 17.8	14.173	20	12 41 19.73	2.2770	10 3 43.4	13.829
21	10 59 24.70	2.0875	1 7 6.8	14.198	21	12 43 36.52	2.2827	10 17 31.9	13.788
22	11 1 30.02	2.0896	0 52 54.4	14.218	22	12 45 53.66	2.2885	10 31 17.6	13.739
23	11 3 35.47	2.0921	N. 0 38 40.7	14.239	23	12 48 11.14	2.2943	S. 10 45 0.5	13.691
TUESDAY 26.					THURSDAY 28.				
0	11 5 41.07	2.0846	N. 0 24 25.7	14.260	0	12 50 28.98	2.3002	S. 10 58 40.5	13.641
1	11 7 46.82	2.0871	N. 0 10 9.6	14.278	1	12 52 47.17	2.3062	11 12 17.4	13.599
2	11 9 52.72	2.0907	S. 0 4 7.7	14.296	2	12 55 5.73	2.3123	11 25 51.2	13.558
3	11 11 58.77	2.1023	0 18 26.0	14.313	3	12 57 24.65	2.3184	11 39 21.7	13.511
4	11 14 4.99	2.1050	0 32 45.3	14.329	4	12 59 43.94	2.3245	11 52 48.9	13.454
5	11 16 11.37	2.1078	0 47 5.4	14.343	5	13 2 3.60	2.3307	12 6 12.6	13.398
6	11 18 17.93	2.1107	1 1 26.4	14.356	6	13 4 23.63	2.3369	12 19 32.7	13.334
7	11 20 24.66	2.1137	1 15 48.2	14.368	7	13 6 44.04	2.3432	12 32 49.2	13.263
8	11 22 31.58	2.1168	1 30 10.6	14.379	8	13 9 4.82	2.3495	12 46 1.8	13.177
9	11 24 38.68	2.1199	1 44 33.6	14.388	9	13 11 25.98	2.3559	12 59 10.5	13.111
10	11 26 45.97	2.1232	1 58 57.2	14.397	10	13 13 47.53	2.3623	13 12 15.1	13.043
11	11 28 53.46	2.1266	2 13 21.3	14.404	11	13 16 9.47	2.3688	13 25 15.6	12.973
12	11 31 1.15	2.1299	2 27 45.7	14.409	12	13 18 31.79	2.3753	13 38 11.9	12.901
13	11 33 9.04	2.1333	2 42 10.4	14.413	13	13 20 54.51	2.3818	13 51 3.8	12.827
14	11 35 17.14	2.1368	2 56 35.3	14.416	14	13 23 17.61	2.3883	14 3 51.2	12.751
15	11 37 25.45	2.1403	3 11 0.4	14.418	15	13 25 41.11	2.3949	14 16 34.0	12.674
16	11 39 33.98	2.1440	3 25 25.5	14.418	16	13 28 5.00	2.4015	14 29 12.1	12.594
17	11 41 42.73	2.1477	3 39 50.6	14.418	17	13 30 29.29	2.4082	14 41 45.3	12.513
18	11 43 51.71	2.1516	3 54 15.6	14.416	18	13 32 53.99	2.4149	14 54 13.6	12.428
19	11 46 0.92	2.1556	4 8 40.4	14.412	19	13 35 19.08	2.4216	15 6 36.8	12.343
20	11 48 10.37	2.1596	4 23 5.0	14.407	20	13 37 44.58	2.4283	15 18 54.8	12.258
21	11 50 20.06	2.1635	4 37 29.2	14.400	21	13 40 10.48	2.4350	15 31 7.5	12.168
22	11 52 29.99	2.1676	4 51 53.0	14.392	22	13 42 36.78	2.4417	15 43 14.7	12.073
23	11 54 40.17	2.1718	5 6 16.2	14.389	23	13 45 3.49	2.4485	15 55 16.4	11.981
24	11 56 50.61	2.1761	S. 5 20 38.8	14.371	24	13 47 30.60	2.4552	S. 16 7 12.4	11.888

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 29.					SATURDAY 30.				
0	13 47 30.60	2.4553	S. 16° 7' 12.4	11.985	0	14 48 21.60	2.6125	S. 20° 20' 10.2	9.009
1	13 49 58.12	2.4620	16 19 2.6	11.787	1	14 50 58.53	2.6194	20 29 6.5	8.866
2	13 52 26.04	2.4688	16 30 46.9	11.686	2	14 53 35.82	2.6244	20 37 54.1	8.730
3	13 54 54.37	2.4756	16 42 25.2	11.587	3	14 56 13.46	2.6302	20 46 32.9	8.573
4	13 57 23.11	2.4823	16 53 57.4	11.484	4	14 58 51.45	2.6360	20 55 2.9	8.434
5	13 59 52.25	2.4891	17 5 23.3	11.378	5	15 1 29.78	2.6417	21 3 23.9	8.274
6	14 2 21.80	2.4959	17 16 42.8	11.271	6	15 4 8.45	2.6473	21 11 35.8	8.123
7	14 4 51.76	2.5027	17 27 55.9	11.163	7	15 6 47.45	2.6527	21 19 38.6	7.969
8	14 7 22.12	2.5095	17 39 2.3	11.051	8	15 9 26.77	2.6580	21 27 32.1	7.814
9	14 9 52.89	2.5163	17 50 2.0	10.938	9	15 12 6.41	2.6633	21 35 16.2	7.667
10	14 12 24.06	2.5230	18 0 54.8	10.823	10	15 14 46.37	2.6684	21 42 50.9	7.499
11	14 14 55.63	2.5296	18 11 40.7	10.706	11	15 17 26.63	2.6734	21 50 16.1	7.339
12	14 17 27.60	2.5361	18 22 19.5	10.588	12	15 20 7.18	2.6788	21 57 31.6	7.177
13	14 19 59.97	2.5427	18 32 51.1	10.466	13	15 22 48.03	2.6832	22 4 37.4	7.014
14	14 22 32.73	2.5493	18 43 15.3	10.343	14	15 25 29.16	2.6879	22 11 33.3	6.860
15	14 25 5.89	2.5559	18 53 32.1	10.217	15	15 28 10.57	2.6924	22 18 19.4	6.695
16	14 27 39.44	2.5624	19 3 41.4	10.090	16	15 30 52.25	2.6969	22 24 55.5	6.518
17	14 30 13.38	2.5689	19 13 43.0	9.963	17	15 33 34.19	2.7013	22 31 21.5	6.349
18	14 32 47.71	2.5753	19 23 36.8	9.831	18	15 36 16.39	2.7058	22 37 37.4	6.179
19	14 35 22.42	2.5817	19 33 22.7	9.699	19	15 38 58.83	2.7098	22 43 43.0	6.008
20	14 37 57.51	2.5880	19 43 0.7	9.564	20	15 41 41.51	2.7138	22 49 38.4	5.836
21	14 40 32.98	2.5943	19 52 30.5	9.428	21	15 44 24.42	2.7170	22 55 23.4	5.663
22	14 43 8.82	2.6004	20 1 52.1	9.290	22	15 47 7.55	2.7208	23 0 58.0	5.489
23	14 45 45.03	2.6065	20 11 5.4	9.151	23	15 49 50.89	2.7246	23 6 22.1	5.314
24	14 48 21.60	2.6126	S. 20° 20' 10.2	9.009	24	15 52 34.43	2.7278	S. 23° 11' 35.7	5.138

PHASES OF THE MOON.

● New Moon,	2	4	4.4
☾ First Quarter,	8	23	44.6
○ Full Moon,	17	1	7.0
☾ Last Quarter,	24	23	7.4

☾ Perigee,	2	5.1
☾ Apogee,	15	18.4
☾ Perigee,	30	17.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
4	SUN W.	26° 5' 54"	2206	27° 49' 34"	2404	29° 33' 3"	2412	31° 16' 20"	2422
	Fomalhaut E.	83 23 56	2487	81 42 24	2604	80 1 16	2522	78 20 33	2540
	α Pegasi E.	103 30 3	2186	101 41 15	2196	99 52 42	2206	98 4 24	2218
5	SUN W.	39 48 54	2486	41 30 29	2600	43 11 42	2616	44 52 34	2632
	Fomalhaut E.	70 4 5	2660	68 26 32	2660	66 49 37	2719	65 13 23	2732
	α Pegasi E.	89 7 35	2267	87 21 17	2304	85 35 24	2321	83 49 55	2336
6	SUN W.	53 11 1	2621	54 49 28	2638	56 27 30	2658	58 5 6	2676
	Fomalhaut E.	57 23 45	2947	55 52 26	2993	54 22 5	3043	52 52 45	3086
	α Pegasi E.	75 9 5	2424	73 26 19	2456	71 44 3	2476	70 2 16	2490
7	SUN W.	66 6 38	2776	67 41 38	2796	69 16 13	2816	70 50 21	2834
	Venus W.	22 42 3	2826	24 15 58	2843	25 49 30	2862	27 22 38	2881
	Fomalhaut E.	45 43 36	3424	44 21 47	3506	43 1 28	3593	41 42 46	3691
	α Pegasi E.	61 41 17	2616	60 2 44	2640	58 24 44	2666	56 47 19	2692
	α Arietis E.	104 3 42	2463	102 21 22	2471	100 39 28	2489	98 58 0	2506
8	SUN W.	78 34 48	2931	80 6 27	2960	81 37 43	2988	83 8 35	2997
	Venus W.	35 2 6	2977	36 32 47	2996	38 3 5	3014	39 33 0	3033
	α Pegasi E.	48 49 16	2636	47 15 35	2667	45 42 34	2690	44 10 15	2695
	α Arietis E.	90 36 58	2598	88 58 0	2616	87 19 25	2632	85 41 14	2660
9	SUN W.	90 37 18	3076	92 5 57	3091	93 34 17	3109	95 2 16	3124
	Venus W.	46 56 58	3122	48 24 41	3138	49 52 4	3164	51 19 8	3171
	α Pegasi E.	36 40 27	3143	35 13 9	3193	33 46 51	3240	32 21 40	3310
	α Arietis E.	77 36 3	2733	76 0 6	2747	74 24 29	2764	72 49 14	2780
	Aldebaran E.	110 21 6	2757	108 45 42	2773	107 10 38	2786	105 35 52	2801
10	SUN W.	102 17 31	3200	103 43 40	3213	105 9 34	3227	106 35 11	3240
	Venus W.	58 29 43	3247	59 54 57	3260	61 19 55	3274	62 44 37	3288
	α Arietis E.	64 57 49	2850	63 24 27	2866	61 51 23	2876	60 18 34	2891
	Aldebaran E.	97 46 33	2868	96 13 33	2880	94 40 48	2893	93 8 19	2906
11	SUN W.	113 39 33	3301	115 3 43	3311	116 27 42	3323	117 51 27	3333
	Venus W.	69 44 25	3347	71 7 42	3368	72 30 46	3398	73 53 39	3379
	α Aquilæ W.	47 29 52	3936	48 42 34	3900	49 55 54	3968	51 9 48	3934
	α Arietis E.	52 38 35	2961	51 7 21	2962	49 36 20	2973	48 5 33	2984
	Aldebaran E.	85 29 34	2969	83 58 31	2969	82 27 40	2978	80 57 0	2989
12	SUN W.	124 47 32	3378	126 10 14	3386	127 32 47	3393	128 55 12	3400
	Venus W.	80 45 20	3423	82 7 11	3431	83 28 53	3438	84 50 27	3445
	α Aquilæ W.	57 26 12	3723	58 42 35	3708	59 59 14	3693	61 16 9	3678
	Fomalhaut W.	34 39 25	4740	35 39 51	4621	36 41 58	4614	37 45 38	4419
	α Arietis E.	40 35 0	3037	39 5 33	3047	37 36 19	3056	36 7 16	3066
	Aldebaran E.	73 26 35	3031	71 57 1	3039	70 27 37	3047	68 58 22	3064
	Pollux E.	115 17 18	3039	113 47 53	3044	112 18 35	3060	110 49 24	3066
13	Venus W.	91 36 27	3476	92 57 19	3479	94 18 7	3484	95 38 49	3486
	α Aquilæ W.	67 43 54	3628	69 1 58	3621	70 20 10	3614	71 38 29	3609
	Fomalhaut W.	43 22 39	4076	44 33 4	4026	45 44 18	3992	46 56 15	3939
	Aldebaran E.	61 34 14	3067	60 5 48	3092	58 37 29	3099	57 9 18	3104
	Pollux E.	103 25 4	3078	101 56 28	3092	100 27 57	3087	98 59 31	3080
14	Venus W.	102 21 17	3505	103 41 36	3507	105 1 52	3510	106 22 5	3511

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
4	SUN W.	32° 59' 24"	2432	34° 42' 13"	2444	36° 24' 45"	2457	38° 6' 59"	2470
	Fomalhaut E.	76 40 15	2490	75 0 25	2481	73 21 4	2497	71 42 18	2481
	α Pegasi E.	96 16 23	2321	94 28 41	2343	92 41 18	2267	90 54 15	2273
5	SUN W.	46 33 3	2548	48 13 9	2566	49 52 51	2583	51 32 9	2602
	Fomalhaut E.	63 37 52	2786	62 3 6	2823	60 29 8	2862	58 56 0	2903
	α Pegasi E.	82 4 51	2336	80 20 13	2375	78 36 3	2394	76 52 20	2414
6	SUN W.	59 42 16	2607	61 19 0	2718	62 55 19	2736	64 31 11	2765
	Fomalhaut E.	51 24 30	3153	49 57 24	3213	48 31 30	3278	47 6 53	3347
	α Pegasi E.	68 21 1	2521	66 40 17	2543	65 0 4	2568	63 20 25	2591
7	SUN W.	72 24 5	2654	73 57 23	2673	75 30 16	2693	77 2 44	2712
	Venus W.	28 55 21	2901	30 27 38	2920	31 59 32	2939	33 31 1	2968
	Fomalhaut E.	40 25 49	2797	39 10 44	2813	37 57 37	4041	36 46 38	4183
	α Pegasi E.	55 10 28	2720	53 34 15	2747	51 58 38	2775	50 23 37	2805
	α Arietis E.	97 16 57	2525	95 36 20	2544	93 56 8	2561	92 16 20	2580
8	SUN W.	84 39 4	3005	86 9 10	3023	87 38 55	3041	89 8 17	3058
	Venus W.	41 2 32	3052	42 31 41	3069	44 0 26	3087	45 28 53	3104
	α Pegasi E.	42 38 41	2973	41 7 53	3010	39 37 53	3061	38 8 43	3095
	α Arietis E.	84 3 27	2667	82 26 3	2684	80 49 1	2700	79 12 21	2716
9	SUN W.	96 29 57	3140	97 57 18	3156	99 24 20	3171	100 51 4	3185
	Venus W.	52 45 52	3187	54 12 17	3203	55 38 23	3217	57 4 12	3232
	α Pegasi E.	30 57 40	3379	29 34 59	3455	28 13 45	3543	26 54 8	3640
	α Arietis E.	71 14 19	2794	69 39 44	2808	68 5 27	2823	66 31 29	2837
	Aldebaran E.	104 1 24	2815	102 27 16	2826	100 53 25	2841	99 19 50	2855
10	SUN W.	108 0 33	3253	109 25 39	3265	110 50 31	3278	112 15 8	3288
	Venus W.	64 9 3	3300	65 33 15	3313	66 57 12	3325	68 20 55	3336
	α Arietis E.	58 46 3	2903	57 13 48	2916	55 41 49	2927	54 10 4	2938
	Aldebaran E.	91 36 5	2916	90 4 7	2927	88 32 22	2938	87 0 51	2950
11	SUN W.	119 15 2	3340	120 38 25	3351	122 1 38	3360	123 24 40	3369
	Venus W.	75 16 20	3397	76 38 51	3397	78 1 11	3406	79 23 21	3415
	α Aquilæ W.	52 24 15	3806	53 39 9	3784	54 54 28	3763	56 10 9	3742
	α Arietis E.	46 35 0	2995	45 4 41	3005	43 34 35	3015	42 4 41	3025
	Aldebaran E.	79 26 33	2996	77 56 18	3006	76 26 13	3016	74 56 19	3023
12	SUN W.	130 17 28	3406	131 39 36	3414	133 1 37	3421	134 23 30	3427
	Venus W.	86 11 53	3451	87 33 12	3456	88 54 23	3463	90 15 28	3469
	α Aquilæ W.	62 33 18	3666	63 50 40	3657	65 8 15	3646	66 26 0	3636
	Fomalhaut W.	38 50 42	4334	39 57 3	4280	41 4 33	4192	42 13 7	4181
	α Arietis E.	34 38 25	3078	33 9 49	3091	31 41 29	3103	30 13 23	3108
	Aldebaran E.	67 29 17	3061	66 0 19	3067	64 31 29	3074	63 2 48	3080
	Pollux E.	109 20 21	3080	107 51 23	3065	106 22 31	3070	104 53 45	3074
13	Venus W.	96 59 27	3492	98 20 0	3496	99 40 29	3498	101 0 55	3502
	α Aquilæ W.	72 56 54	3603	74 15 26	3596	75 34 2	3594	76 52 44	3599
	Fomalhaut W.	48 8 55	3908	49 22 12	3899	50 36 3	3897	51 50 27	3899
	Aldebaran E.	55 41 13	3110	54 13 16	3115	52 45 25	3121	51 17 41	3125
	Pollux E.	97 31 9	3093	96 2 51	3096	94 34 36	3099	93 6 25	3101
14	Venus W.	107 42 17	3513	109 2 27	3515	110 22 34	3515	111 42 41	3517

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
14	α Aquilæ W.	78° 11' 29"	3087	79° 30' 19"	3083	80° 49' 11"	3081	82° 8' 6"	3079
	Fomalhaut W.	53 5 20	3783	54 20 40	3788	55 36 26	3787	56 52 34	3715
	Aldebaran E.	49 50 2	3131	48 22 30	3128	46 55 7	3143	45 27 50	3150
	Pollux E.	91 38 17	3104	90 10 12	3106	88 42 10	3108	87 14 10	3110
15	α Aquilæ W.	88 43 5	3075	90 2 7	3075	91 21 9	3076	92 40 10	3077
	Fomalhaut W.	63 18 15	3033	64 26 14	3021	65 54 26	3008	67 12 52	3007
	α Pegasi W.	41 7 3	3306	42 29 24	3379	43 52 4	3365	45 15 1	3349
	Aldebaran E.	38 13 15	3133	36 46 45	3130	35 20 24	3100	33 54 15	3090
	Pollux E.	79 54 39	3117	78 26 50	3117	76 59 1	3119	75 31 14	3119
16	α Aquilæ W.	99 14 45	3000	100 33 31	3003	101 52 13	3006	103 10 50	3008
	Fomalhaut W.	73 47 53	3049	75 7 23	3042	76 27 1	3035	77 46 46	3028
	α Pegasi W.	52 13 38	3000	53 38 1	3032	55 2 34	3073	56 27 17	3066
	Pollux E.	68 12 25	3121	66 44 41	3130	65 16 55	3121	63 49 11	3120
	Regulus E.	105 1 43	3004	103 33 14	3023	102 4 43	3061	100 36 10	3080
17	Fomalhaut W.	84 27 13	3002	85 47 35	3096	87 8 1	3096	88 28 31	3092
	α Pegasi W.	63 33 13	3026	64 58 49	3222	66 24 32	3215	67 50 23	3208
	Pollux E.	56 30 26	3130	55 2 41	3130	53 34 57	3130	52 7 12	3120
	Regulus E.	93 12 57	3070	91 44 11	3067	90 15 21	3065	88 46 29	3063
	Saturn E.	116 1 1	3133	114 33 19	3119	113 5 34	3116	111 37 44	3113
	Jupiter E.	118 10 44	3143	116 43 26	3138	115 16 4	3136	113 48 38	3133
18	α Pegasi W.	75 1 26	3161	76 27 58	3176	77 54 36	3170	79 21 21	3164
	α Arietis W.	31 30 27	3105	32 58 31	3093	34 26 45	3086	35 55 10	3080
	Pollux E.	44 48 37	3135	43 20 58	3137	41 53 21	3139	40 25 46	3131
	Regulus E.	81 21 18	3048	79 52 5	3044	78 22 47	3040	76 53 24	3038
	Saturn E.	104 17 30	3004	102 49 14	3001	101 20 52	3007	99 52 26	3002
	Jupiter E.	106 30 26	3116	105 2 35	3110	103 34 37	3106	102 6 35	3103
19	α Pegasi W.	86 36 42	3180	88 4 4	3134	89 31 32	3139	90 59 6	3134
	α Arietis W.	43 19 35	3043	44 48 55	3096	46 18 23	3099	47 48 0	3022
	Pollux E.	33 8 59	3156	31 41 59	3168	30 15 12	3179	28 48 38	3190
	Regulus E.	69 25 24	3013	67 55 33	3013	66 25 35	3009	64 55 33	3004
	Saturn E.	92 28 57	3000	90 59 58	3005	89 30 53	3000	88 1 42	3005
	Jupiter E.	94 45 7	3070	93 16 32	3074	91 47 51	3069	90 19 4	3064
20	α Arietis W.	55 18 13	3067	56 48 42	3020	58 19 19	3073	59 50 6	3065
	Aldebaran W.	23 21 27	3210	24 47 24	3178	26 13 59	3161	27 41 7	3134
	Regulus E.	57 23 51	3078	55 53 11	3073	54 22 25	3067	52 51 31	3062
	Saturn E.	80 34 10	3018	79 4 19	3011	77 34 20	3005	76 4 13	3009
	Jupiter E.	82 53 29	3036	81 24 0	3030	79 54 24	3022	78 24 39	3017
	Spica E.	111 23 56	3005	109 52 59	3008	108 21 54	3002	106 50 41	3005
	Mars E.	118 24 9	3030	116 58 31	3319	115 32 44	3212	114 6 49	3204
21	α Arietis W.	67 26 27	3026	68 58 13	3017	70 30 11	3009	72 2 19	3008
	Aldebaran W.	35 4 0	3023	36 33 44	3006	38 3 49	3000	39 34 14	2975
	Regulus E.	45 15 10	3031	43 43 31	3025	42 11 44	3019	40 39 49	3012
	Saturn E.	68 31 39	3006	67 0 43	3008	65 29 38	3001	63 58 24	2993
	Jupiter E.	70 53 54	3031	69 23 18	3072	67 52 32	3065	66 21 37	3068
	Spica E.	99 12 20	3006	97 40 11	3000	96 7 52	2992	94 35 23	2983
	Mars E.	106 54 52	3108	105 27 59	3154	104 0 55	3146	102 33 41	3136
	SUN E.	136 31 47	3006	135 7 22	3076	133 42 45	3070	132 17 58	2969

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXTh.	P. L. of Dist.
14	α Aquilæ W.	83° 27' 3"	3077	84° 46' 2"	3076	86° 5' 2"	3076	87° 24' 3"	3076
	Fomalhaut W.	58 9 5	3068	59 25 56	3079	60 43 5	3068	62 0 32	3048
	Aldebaran E.	44 0 41	3106	42 33 39	3100	41 6 42	3106	39 39 54	3175
	Pollux E.	85 46 12	3111	84 18 17	3113	82 50 23	3114	81 22 30	3115
15	α Aquilæ W.	93 59 9	3078	95 18 7	3081	96 37 2	3083	97 55 55	3086
	Fomalhaut W.	68 31 30	3068	69 50 20	3076	71 9 21	3066	72 28 32	3057
	α Pegasi W.	46 38 16	3226	48 1 47	3224	49 25 31	3213	50 49 28	3201
	Aldebaran E.	32 28 17	3119	31 2 30	3233	29 37 0	3250	28 11 50	3270
	Pollux E.	74 3 27	3119	72 35 41	3120	71 7 56	3119	69 40 10	3120
16	α Aquilæ W.	104 29 22	3069	105 47 47	3014	107 6 6	3021	108 24 18	3030
	Fomalhaut W.	79 6 39	3023	80 26 39	3016	81 46 45	3012	83 6 56	3006
	α Pegasi W.	57 52 10	3226	59 17 13	3240	60 42 25	3243	62 7 45	3235
	Pollux E.	62 21 26	3120	60 53 41	3120	58 25 56	3120	57 58 11	3120
	Regulus E.	99 7 36	3078	97 39 0	3076	96 10 21	3074	94 41 40	3073
17	Fomalhaut W.	89 49 4	3068	91 9 41	3066	92 30 21	3066	93 51 2	3063
	α Pegasi W.	69 16 22	3208	70 42 26	3197	72 6 41	3193	73 35 0	3196
	Pollux E.	50 39 28	3121	49 11 44	3129	47 44 1	3128	46 16 19	3124
	Regulus E.	87 17 34	3080	85 48 35	3087	84 19 33	3086	82 50 28	3081
	Saturn E.	110 9 50	3110	108 41 52	3105	107 13 49	3103	105 45 42	3099
	Jupiter E.	112 21 8	3120	110 53 34	3126	109 25 56	3123	107 58 13	3118
18	α Pegasi W.	80 48 14	3160	82 15 12	3164	83 42 16	3149	85 9 26	3144
	α Arietis W.	37 23 44	3071	38 52 29	3066	40 21 22	3067	41 50 24	3060
	Pollux E.	38 58 13	3124	37 30 46	3140	36 3 25	3144	34 36 9	3149
	Regulus E.	75 23 58	3024	73 54 27	3030	72 24 51	3026	70 55 10	3022
	Saturn E.	98 23 55	3078	96 55 19	3073	95 26 37	3068	93 57 50	3065
	Jupiter E.	100 38 29	3080	99 10 18	3088	97 42 0	3080	96 13 37	3083
19	α Pegasi W.	92 26 46	3119	98 54 33	3114	95 22 25	3109	96 50 24	3106
	α Arietis W.	49 17 45	3015	50 47 39	3008	52 17 42	3001	53 47 53	2994
	Pollux E.	27 22 17	3200	25 56 16	3233	24 30 48	3257	23 5 46	3262
	Regulus E.	63 25 25	2990	61 55 11	2994	60 24 51	2989	58 54 24	2984
	Saturn E.	86 32 25	3040	85 3 1	3034	83 33 31	3029	82 3 54	3023
	Jupiter E.	88 50 10	3060	87 21 11	3063	85 52 3	3048	84 22 50	3041
20	α Arietis W.	61 21 3	2943	62 52 9	2960	64 23 25	2942	65 54 51	2934
	Aldebaran W.	29 8 48	3080	30 36 59	3078	32 5 36	3068	33 34 37	3040
	Regulus E.	51 20 30	2946	49 49 22	2960	48 18 6	2943	46 46 42	2937
	Saturn E.	74 33 59	2992	73 3 36	2985	71 33 7	2979	70 2 26	2973
	Jupiter E.	76 54 47	3010	75 24 47	3003	73 54 38	2996	72 24 20	2989
	Spica E.	105 19 19	2936	103 47 48	2931	102 16 9	2924	100 44 20	2915
	Mars E.	112 40 45	3107	111 14 32	3106	109 48 8	3100	108 21 35	3172
21	α Arietis W.	73 34 39	2991	75 7 10	2981	76 39 54	2972	78 12 49	2962
	Aldebaran W.	41 4 58	2980	42 36 1	2946	44 7 21	2933	45 38 58	2919
	Regulus E.	39 7 46	2906	37 35 35	2900	36 3 15	2894	34 30 48	2887
	Saturn E.	62 27 0	2936	60 55 27	2926	59 23 43	2920	57 51 49	2912
	Jupiter E.	64 50 32	2960	63 19 17	2943	61 47 52	2934	60 16 16	2925
	Spica E.	93 2 43	2975	91 29 52	2966	89 56 48	2957	88 23 34	2946
	Mars E.	101 6 15	3126	99 38 37	3117	96 10 48	3107	96 42 47	3097
	Sun E.	130 52 58	2349	129 27 47	2326	128 2 23	2326	126 36 47	2318

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
22	α Arietis W.	79° 45' 57"	2852	81° 19' 17"	2842	82° 52' 51"	2831	84° 26' 38"	2821
	Aldebaran W.	47 10 53	2806	48 43 6	2891	50 15 35	2879	51 48 21	2868
	Regulus E.	32 58 13	2882	31 25 31	2877	29 52 43	2872	28 19 48	2860
	Saturn E.	56 19 45	2803	54 47 31	2896	53 15 6	2887	51 42 31	2879
	Jupiter E.	58 44 29	2916	57 12 30	2907	55 40 20	2898	54 7 59	2889
	Spica E.	86 50 6	2837	85 16 26	2827	83 42 33	2817	82 8 27	2808
	Mars E.	95 14 34	2887	93 46 8	2876	92 17 29	2865	90 48 37	2854
	SUN E.	125 10 59	2907	123 44 58	2195	122 18 43	2184	120 52 15	2172
23	α Arietis W.	92 19 8	2764	93 54 22	2753	95 29 53	2740	97 5 40	2727
	Aldebaran W.	59 36 31	2798	61 11 2	2786	62 45 50	2770	64 20 57	2756
	Pollux W.	18 49 56	2171	20 16 40	2096	21 44 52	2080	23 14 17	2069
	Saturn E.	43 56 56	2838	42 23 18	2831	40 49 30	2823	39 15 32	2814
	Jupiter E.	46 23 17	2842	44 49 44	2832	43 15 58	2826	41 42 2	2816
	Spica E.	74 14 28	2750	72 38 55	2738	71 3 5	2726	69 27 0	2714
	Mars E.	83 20 42	2804	81 50 22	2802	80 19 47	2800	78 48 55	2806
	SUN E.	113 36 14	2110	112 8 16	2096	110 40 1	2082	109 11 30	2069
24	α Arietis W.	105 8 50	2863	106 46 20	2849	108 24 9	2835	110 2 17	2821
	Aldebaran W.	72 21 10	2885	73 58 10	2870	75 35 30	2855	77 13 11	2840
	Pollux W.	30 55 2	2802	32 29 27	2776	34 4 27	2761	35 39 59	2756
	Saturn E.	31 23 37	2792	29 48 58	2791	28 14 18	2792	26 39 40	2798
	Jupiter E.	33 49 29	2775	32 14 28	2769	30 39 19	2764	29 4 4	2761
	Spica E.	61 22 21	2848	59 44 31	2834	58 6 22	2820	56 27 54	2807
	Mars E.	71 10 23	2887	69 37 47	2873	68 4 53	2858	66 31 40	2843
	SUN E.	101 44 34	2896	100 14 16	2890	98 43 38	2880	97 12 41	2869
25	Aldebaran W.	85 26 46	2864	87 6 31	2848	88 46 37	2833	90 27 5	2815
	Pollux W.	43 45 44	2812	45 24 23	2802	47 3 29	2872	48 43 3	2862
	Spica E.	48 10 43	2833	46 30 15	2818	44 49 27	2808	43 8 18	2808
	Mars E.	58 40 44	2767	57 5 33	2782	55 30 2	2786	53 54 9	2721
	SUN E.	89 32 52	2887	87 59 51	2860	86 26 28	2833	84 52 43	2816
26	Pollux W.	57 7 37	2457	58 49 51	2438	60 32 32	2420	62 15 38	2403
	Regulus W.	20 9 37	2809	21 50 38	2475	23 32 24	2449	25 14 51	2420
	Mars E.	45 49 42	2844	44 11 47	2829	42 33 31	2816	40 54 56	2801
	SUN E.	76 58 22	2729	75 22 21	2712	73 45 57	2694	72 9 9	2678
27	Pollux W.	70 57 30	2816	72 43 6	2809	74 29 6	2804	76 15 30	2807
	Regulus W.	33 55 47	2812	35 41 29	2802	37 27 40	2874	39 14 17	2866
	Mars E.	32 37 24	2839	30 57 5	2830	29 16 33	2821	27 35 49	2816
	SUN E.	63 59 25	2691	62 20 18	2675	60 40 49	2659	59 0 57	2643
28	Pollux W.	85 13 12	2184	87 1 47	2181	88 50 44	2180	90 39 59	2185
	Regulus W.	48 13 51	2175	50 2 58	2160	51 52 25	2147	53 42 13	2132
	Saturn W.	25 14 57	2844	26 59 52	2810	28 45 36	2800	30 32 5	2806
	Jupiter W.	22 16 18	2863	24 0 46	2826	25 46 7	2826	27 32 14	2806
	SUN E.	50 36 12	2467	48 54 12	2463	47 11 53	2440	45 29 15	2436
29	Pollux W.	99 50 44	2102	101 41 40	2094	103 32 49	2086	105 24 8	2079
	Regulus W.	62 56 6	2075	64 47 44	2064	66 39 38	2055	68 31 46	2046
	Saturn W.	39 33 19	2152	41 22 57	2138	43 12 58	2124	45 3 20	2112
	Jupiter W.	36 31 50	2165	38 21 11	2149	40 10 55	2136	42 1 0	2124
	SUN E.	36 51 41	2371	35 7 24	2362	33 22 54	2353	31 38 12	2346

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	α Arietis W.	86° 0' 39"	2610	87° 34' 54"	2798	89° 9' 24"	2788	90° 44' 8"	2775
	Aldebaran W.	53 21 24	2662	54 54 45	2838	56 28 23	2825	58 2 18	2811
	Regulus E.	26 46 49	2666	25 13 46	2663	23 40 40	2664	22 7 35	2666
	Saturn E.	50 9 45	2671	48 36 49	2682	47 3 42	2654	45 30 24	2646
	Jupiter E.	52 35 27	2682	51 2 42	2673	49 29 45	2663	47 56 38	2666
	Spica E.	80 34 9	2795	78 59 35	2785	77 24 47	2774	75 49 45	2763
	Mars E.	89 19 31	3043	87 50 11	3031	86 20 37	3018	84 50 47	3006
	SUN E.	119 25 32	3160	117 58 35	3148	116 31 23	3135	115 3 56	3123
23	α Arietis W.	98 41 44	2715	100 18 4	2701	101 54 42	2689	103 31 37	2675
	Aldebaran W.	65 56 22	2743	67 32 6	2729	69 8 8	2713	70 44 30	2700
	Pollux W.	24 44 44	2642	26 16 9	2603	27 48 24	2670	29 21 21	2636
	Saturn E.	37 41 22	2606	36 7 4	2603	34 32 40	2798	32 58 10	2796
	Jupiter E.	40 7 54	2605	38 33 34	2797	36 59 3	2788	35 24 21	2782
	Spica E.	67 50 39	2701	66 14 1	2688	64 37 5	2675	62 59 52	2662
	Mars E.	77 17 47	2643	75 46 23	2628	74 14 40	2616	72 42 41	2601
	SUN E.	107 42 42	3065	106 13 37	3040	104 44 14	3024	103 14 33	3011
24	α Arietis W.	111 40 45	2606	113 19 32	2692	114 58 38	2677	116 38 4	2663
	Aldebaran W.	78 51 11	2624	80 29 33	2608	82 8 17	2693	83 47 21	2678
	Pollux W.	37 16 6	2700	38 52 46	2678	40 29 56	2656	42 7 35	2634
	Saturn E.	25 5 10	2606	23 30 49	2619	21 56 46	2639	20 23 9	2669
	Jupiter E.	27 28 45	2760	25 53 25	2761	24 18 6	2766	22 42 54	2776
	Spica E.	54 49 8	2692	53 10 2	2677	51 30 35	2663	49 50 49	2646
	Mars E.	64 58 8	2628	63 24 17	2612	61 50 5	2798	60 15 35	2782
	SUN E.	95 41 24	2633	94 9 47	2617	92 37 50	2601	91 5 32	2683
25	Aldebaran W.	92 7 56	2499	93 49 10	2485	95 30 45	2468	96 12 43	2453
	Pollux W.	50 23 4	2633	52 3 32	2613	53 44 27	2494	55 25 49	2476
	Spica E.	41 26 48	2473	39 44 57	2458	38 2 45	2443	36 20 11	2429
	Mars E.	52 17 57	2705	50 41 24	2690	49 4 31	2674	47 27 16	2660
	SUN E.	83 18 36	2798	81 44 6	2782	80 9 14	2764	78 33 59	2747
26	Pollux W.	63 59 11	2684	65 43 8	2666	67 27 30	2650	69 12 17	2633
	Regulus W.	26 57 57	2696	28 41 37	2673	30 25 50	2653	32 10 32	2631
	Mars E.	39 16 2	2667	37 36 49	2673	35 57 17	2661	34 17 28	2660
	SUN E.	70 31 59	2660	68 54 25	2643	67 16 28	2626	65 38 8	2609
27	Pollux W.	78 2 18	2262	79 49 28	2237	81 37 1	2223	83 24 55	2207
	Regulus W.	41 1 23	2240	42 48 53	2221	44 36 47	2206	46 25 6	2187
	Mars E.	25 54 57	2611	24 13 59	2611	22 33 1	2614	20 52 7	2617
	SUN E.	57 20 43	2626	55 40 6	2612	53 59 9	2497	52 17 51	2483
28	Pollux W.	92 29 35	2142	94 19 29	2132	96 9 40	2123	98 0 4	2113
	Regulus W.	55 32 23	2119	57 22 53	2109	59 13 39	2096	61 4 44	2085
	Saturn W.	32 19 14	2227	34 7 1	2207	35 55 18	2187	37 44 5	2170
	Jupiter W.	29 19 4	2242	31 6 29	2220	32 54 27	2200	34 42 55	2182
	SUN E.	43 46 18	2414	42 3 3	2403	40 19 32	2391	38 35 44	2380
29	Pollux W.	107 15 41	2073	109 7 22	2066	110 59 13	2062	112 51 10	2067
	Regulus W.	70 24 7	2039	72 16 39	2033	74 9 23	2026	76 2 16	2020
	Saturn W.	46 54 1	2101	48 44 59	2090	50 36 13	2081	52 27 41	2073
	Jupiter W.	43 51 23	2113	45 42 4	2101	47 33 1	2093	49 24 11	2085
	SUN E.	29 53 19	2339	28 8 17	2338	26 23 6	2328	24 37 48	2326

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from		DNE. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.	added to Apparent Time.				
Sun.	1	16 ^h 30 ^m 35.41 ^s	10.810	S. 21° 52' 0.5"	23.03	16 16.04	70.33	10 40.80	0.956		
Mon.	2	16 34 55.25	10.836	22 1 1.0	21.97	16 16.18	70.41	10 17.59	0.982		
Tues.	3	16 39 15.70	10.861	22 9 36.0	20.90	16 16.32	70.49	9 53.76	1.007		
Wed.	4	16 43 36.74	10.885	22 17 45.2	19.83	16 16.46	70.57	9 29.35	1.030		
Thur.	5	16 47 58.33	10.908	22 25 28.4	18.74	16 16.60	70.65	9 4.40	1.052		
Fri.	6	16 52 20.44	10.929	22 32. 45.3	17.64	16 16.73	70.72	8 38.93	1.072		
Sat.	7	16 56 43.05	10.949	22 39 35.8	16.54	16 16.86	70.79	8 12.96	1.094		
Sun.	8	17 1 6.14	10.968	22 45 59.6	15.42	16 16.99	70.85	7 46.50	1.112		
Mon.	9	17 5 29.67	10.985	22 51 56.3	14.29	16 17.11	70.91	7 19.62	1.130		
Tues.	10	17 9 53.61	11.002	22 57 25.9	13.16	16 17.23	70.97	6 52.33	1.146		
Wed.	11	17 14 17.94	11.018	23 2 28.3	12.02	16 17.34	71.02	6 24.65	1.161		
Thur.	12	17 18 42.61	11.032	23 7 3.4	10.88	16 17.44	71.07	5 56.62	1.175		
Fri.	13	17 23 7.62	11.045	23 11 10.9	9.73	16 17.54	71.11	5 28.26	1.189		
Sat.	14	17 27 32.92	11.056	23 14 50.8	8.57	16 17.64	71.15	4 59.62	1.201		
Sun.	15	17 31 58.48	11.067	23 18 2.9	7.41	16 17.73	71.19	4 30.72	1.212		
Mon.	16	17 36 24.27	11.076	23 20 46.9	6.25	16 17.81	71.22	4 1.59	1.220		
Tues.	17	17 40 50.27	11.083	23 23 2.9	5.08	16 17.88	71.24	3 32.25	1.227		
Wed.	18	17 45 16.46	11.090	23 24 50.8	3.90	16 17.95	71.26	3 2.71	1.233		
Thur.	19	17 49 42.78	11.095	23 26 10.6	2.72	16 17.02	71.28	2 33.05	1.238		
Fri.	20	17 54 9.23	11.100	23 27 2.1	1.54	16 18.08	71.29	2 3.26	1.243		
Sat.	21	17 58 35.76	11.103	23 27 25.3	0.36	16 18.13	71.30	1 33.39	1.246		
Sun.	22	18 3 2.36	11.105	23 27 20.1	0.81	16 18.17	71.30	1 3.46	1.247		
Mon.	23	18 7 28.98	11.105	23 26 46.6	1.99	16 18.21	71.30	0 33.50	1.247		
Tues.	24	18 11 55.58	11.104	23 25 44.8	3.17	16 18.25	71.29	0 3.55	1.246		
Wed.	25	18 16 22.14	11.101	23 24 14.7	4.35	16 18.28	71.28	0 26.37	1.244		
Thur.	26	18 20 48.63	11.097	23 22 16.2	5.52	16 18.30	71.27	0 56.22	1.241		
Fri.	27	18 25 15.01	11.092	23 19 49.5	6.70	16 18.32	71.25	1 25.96	1.236		
Sat.	28	18 29 41.23	11.085	23 16 54.6	7.87	16 18.33	71.22	1 55.54	1.229		
Sun.	29	18 34 7.27	11.077	23 13 31.6	9.04	16 18.34	71.19	2 24.95	1.220		
Mon.	30	18 38 33.08	11.067	23 9 40.7	10.20	16 18.35	71.15	2 54.12	1.209		
Tues.	31	18 42 58.63	11.056	23 5 21.9	11.36	16 18.36	71.11	3 23.03	1.197		
Wed.	32	18 47 23.88	11.043	S. 23 0 35.3	12.51	16 18.36	71.07	3 51.64	1.185		

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	subtracted from Mean Time.			
Sun.	1	^h 16 ^m 30 ^s 37.34	10.810	S.21° 52' 4.6"	23.03	^m 10 ^s 40.97	0.956	^h 16 ^m 41 ^s 18.31	
Mon.	2	16 34 57.11	10.836	22 1 4.7	21.97	10 17.76	0.982	16 45 14.87	
Tues.	3	16 39 17.49	10.861	22 9 39.4	20.90	9 53.93	1.007	16 49 11.42	
Wed.	4	16 43 38.46	10.895	22 17 48.3	19.83	9 29.52	1.030	16 53 7.98	
Thur.	5	16 47 59.98	10.908	22 25 31.2	18.74	9 4.56	1.052	16 57 4.54	
Fri.	6	16 52 22.02	10.929	22 32 47.8	17.64	8 39.08	1.072	17 1 1.10	
Sat.	7	16 56 44.55	10.949	22 39 38.0	16.54	8 13.11	1.092	17 4 57.66	
Sun.	8	17 1 7.56	10.968	22 46 1.5	15.42	7 46.65	1.112	17 8 54.21	
Mon.	9	17 5 31.01	10.985	22 51 58.0	14.29	7 19.76	1.130	17 12 50.77	
Tues.	10	17 9 54.87	11.002	22 57 27.4	13.16	6 52.46	1.147	17 16 47.33	
Wed.	11	17 14 19.12	11.018	23 2 29.6	12.02	6 24.77	1.161	17 20 43.89	
Thur.	12	17 18 43.71	11.032	23 7 4.5	10.88	5 56.74	1.175	17 24 40.45	
Fri.	13	17 23 8.63	11.045	23 11 11.8	9.73	5 28.37	1.189	17 28 37.00	
Sat.	14	17 27 33.84	11.056	23 14 51.5	8.57	4 59.72	1.201	17 32 33.56	
Sun.	15	17 31 59.31	11.067	23 18 3.4	7.41	4 30.81	1.212	17 36 30.12	
Mon.	16	17 36 25.01	11.076	23 20 47.3	6.25	4 1.67	1.220	17 40 26.68	
Tues.	17	17 40 50.92	11.083	23 23 3.2	5.08	3 32.32	1.227	17 44 23.24	
Wed.	18	17 45 17.02	11.090	23 24 51.0	3.90	3 2.77	1.233	17 48 19.79	
Thur.	19	17 49 43.25	11.095	23 26 10.7	2.72	2 33.10	1.238	17 52 16.35	
Fri.	20	17 54 9.61	11.100	23 27 2.2	1.54	2 3.30	1.243	17 56 12.91	
Sat.	21	17 58 36.05	11.103	23 27 25.3	0.36	1 33.42	1.246	18 0 9.47	
Sun.	22	18 3 2.55	11.105	23 27 20.1	0.81	1 3.48	1.247	18 4 6.03	
Mon.	23	18 7 29.08	11.105	23 26 46.6	1.99	0 33.51	1.247	18 8 2.59	
Tues.	24	18 11 55.59	11.104	23 25 44.8	3.17	0 3.55	1.246	18 11 59.14	
Wed.	25	18 16 22.06	11.101	23 24 14.7	4.35	0 26.36	1.244	18 15 55.70	
Thur.	26	18 20 48.46	11.097	23 22 16.3	5.52	0 56.20	1.241	18 19 52.26	
Fri.	27	18 25 14.75	11.092	23 19 49.7	6.70	1 25.93	1.236	18 23 48.82	
Sat.	28	18 29 40.88	11.085	23 16 54.9	7.87	1 55.50	1.229	18 27 45.38	
Sun.	29	18 34 6.83	11.077	23 13 32.0	9.04	2 24.90	1.220	18 31 41.93	
Mon.	30	18 38 32.55	11.067	23 9 41.2	10.20	2 54.06	1.209	18 35 38.49	
Tues.	31	18 42 58.01	11.056	23 5 22.5	11.36	3 22.96	1.197	18 39 35.05	
Wed.	32	18 47 23.17	11.043	S.23° 0' 36.0"	12.51	3 51.56	1.185	18 43 31.61	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.							
		λ	λ'									
1	335	249° 20' 45.3	19° 43.0	152.24	—0.66	9.9987077	27.2	7 17 29.83				
2	336	250 21 89.7	20 37.3	152.28	0.56	.9986431	26.6	7 13 33.92				
3	337	251 22 35.1	21 32.5	152.32	0.44	.9985798	26.1	7 9 38.01				
4	338	252 23 31.5	22 28.7	152.36	0.31	.9985179	25.5	7 5 42.10				
5	339	253 24 28.7	23 25.7	152.40	0.18	.9984575	24.9	7 1 46.18				
6	340	254 25 26.8	24 23.6	152.44	—0.07	.9983987	24.2	6 57 50.27				
7	341	255 26 25.6	25 22.3	152.47	+0.03	.9983415	23.5	6 53 54.36				
8	342	256 27 25.0	26 21.5	152.49	0.11	.9982861	22.7	6 49 58.45				
9	343	257 28 25.0	27 21.3	152.51	0.17	.9982325	21.9	6 46 2.54				
10	344	258 29 25.5	28 21.6	152.53	0.19	.9981810	21.0	6 42 6.62				
11	345	259 30 26.6	29 22.5	152.55	0.17	.9981316	20.1	6 38 10.71				
12	346	260 31 28.1	30 23.9	152.57	0.12	.9980845	19.1	6 34 14.80				
13	347	261 32 30.1	31 25.7	152.59	+0.06	.9980398	18.0	6 30 18.89				
14	348	262 33 32.6	32 28.0	152.61	—0.03	.9979977	16.9	6 26 22.98				
15	349	263 34 35.5	33 30.7	152.63	0.15	.9979582	15.8	6 22 27.06				
16	350	264 35 39.0	34 34.0	152.66	0.28	.9979215	14.7	6 18 31.15				
17	351	265 36 43.1	35 37.9	152.69	0.41	.9978877	13.5	6 14 35.24				
18	352	266 37 47.7	36 42.3	152.72	0.54	.9978567	12.3	6 10 39.33				
19	353	267 38 53.0	37 47.4	152.75	0.67	.9978285	11.2	6 6 43.42				
20	354	268 39 58.9	38 53.1	152.77	0.78	.9978029	10.1	6 2 47.50				
21	355	269 41 5.4	39 59.4	152.79	0.88	.9977799	9.0	5 58 51.59				
22	356	270 42 12.6	41 6.4	152.82	0.95	.9977596	8.0	5 54 55.68				
23	357	271 43 20.5	42 14.1	152.84	0.99	.9977417	7.0	5 50 59.77				
24	358	272 44 29.0	43 22.4	152.86	0.99	.9977262	6.0	5 47 3.86				
25	359	273 45 37.9	44 31.1	152.88	0.99	.9977130	5.0	5 43 7.94				
26	360	274 46 47.3	45 40.4	152.90	0.96	.9977020	4.1	5 39 12.03				
27	361	275 47 57.3	46 50.2	152.92	0.89	.9976929	3.4	5 35 16.12				
28	362	276 49 7.7	48 0.4	152.94	0.79	.9976857	2.6	5 31 20.21				
29	363	277 50 18.4	49 10.9	152.95	0.67	.9976803	1.9	5 27 24.30				
30	364	278 51 29.4	50 21.7	152.96	0.55	.9976766	1.2	5 23 28.37				
31	365	279 52 40.6	51 32.8	152.97	0.43	.9976746	0.5	5 19 32.46				
32	366	280 53 52.0	52 44.0	152.97	—0.31	.9976743	0.2	5 15 36.55				

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 04.

GREENWICH MEAN TIME.

THE MOON'S

GREENWICH MEAN TIME.									
Day of the Month.	THE MOON'S								
	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h m	Diff. for 1 hour.	
1	16' 42.2	16' 40.8	61' 11.5	-0.23	61' 6.4	-0.63	0 6	2.71	28.8
2	16 38.0	16 34.1	60 56.4	1.02	60 42.0	1.38	0 13.9	2.71	0.4
3	16 29.1	16 23.1	60 23.6	1.69	60 1.6	1.95	1 18.0	2.62	1.4
4	16 16.4	16 9.1	59 36.9	2.16	59 10.0	2.31	2 18.8	2.44	2.4
5	16 1.4	15 53.5	58 41.6	2.40	58 12.6	2.43	3 14.7	2.23	3.4
6	15 45.5	15 37.8	57 43.5	2.41	57 15.0	2.34	4 5.8	2.04	4.4
7	15 30.3	15 23.2	56 47.5	2.23	56 21.5	2.09	4 52.8	1.89	5.4
8	15 16.6	15 10.6	55 57.4	1.93	55 35.3	1.75	5 36.8	1.79	6.4
9	15 5.2	15 0.4	55 15.4	1.56	54 57.9	1.36	6 19.1	1.74	7.4
10	14 56.3	14 52.9	54 42.9	1.15	54 30.2	0.95	7 0.8	1.74	8.4
11	14 50.1	14 48.0	54 20.1	0.75	54 12.2	0.56	7 42.9	1.77	9.4
12	14 46.5	14 45.6	54 6.7	0.37	54 3.3	-0.19	8 26.2	1.84	10.4
13	14 45.2	14 45.4	54 2.0	-0.03	54 2.6	+0.13	9 11.4	1.93	11.4
14	14 46.0	14 47.1	54 5.0	+0.27	54 8.9	0.39	9 58.7	2.02	12.4
15	14 48.6	14 50.4	54 14.4	0.51	54 21.1	0.61	10 48.1	2.09	13.4
16	14 52.6	14 55.0	54 29.0	0.71	54 38.0	0.79	11 38.8	2.13	14.4
17	14 57.7	15 0.6	54 47.9	0.86	54 58.7	0.93	12 29.9	2.13	15.4
18	15 3.8	15 7.1	55 10.2	0.99	55 22.5	1.05	13 20.6	2.09	16.4
19	15 10.7	15 14.4	55 35.5	1.11	55 49.1	1.16	14 9.9	2.03	17.4
20	15 18.3	15 22.3	56 3.4	1.22	56 18.3	1.27	14 57.9	1.97	18.4
21	15 26.6	15 31.0	56 33.9	1.32	56 50.1	1.38	15 44.6	1.93	19.4
22	15 35.5	15 40.3	57 6.9	1.43	57 24.3	1.47	16 30.9	1.93	20.4
23	15 45.2	15 50.1	57 42.1	1.51	58 0.5	1.54	17 17.5	1.97	21.4
24	15 55.2	16 0.3	58 19.0	1.55	58 37.6	1.55	18 5.8	2.06	22.4
25	16 5.3	16 10.1	58 56.0	1.52	59 13.9	1.45	18 56.7	2.19	23.4
26	16 14.7	16 19.0	59 30.8	1.36	59 46.4	1.23	19 51.4	2.36	24.4
27	16 22.7	16 25.8	60 0.1	1.06	60 11.6	0.85	20 50.1	2.53	25.4
28	16 28.2	16 29.7	60 20.3	0.60	60 25.9	+0.32	21 52.3	2.64	26.4
29	16 30.3	16 29.9	60 28.0	+0.02	60 26.3	-0.29	22 56.0	2.65	27.4
30	16 28.4	16 25.9	60 20.9	-0.61	60 11.7	0.92	23 58.5	2.55	28.4
31	16 22.4	16 18.0	59 58.9	1.22	59 42.6	1.48	0		29.4
32	16 12.7	16 6.8	59 23.4	-1.72	59 1.6	-1.91	0 57.6	2.37	0.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	15 52 34.43	2.7273	S. 23° 11' 35.7"	5.188	0	18 3 57.10	2.6780	S. 23° 46' 26.2"	3.028
1	15 55 18.16	2.7304	23 16 38.6	4.980	1	18 6 37.63	2.6728	23 42 43.6	3.785
2	15 58 2.08	2.7334	23 21 30.9	4.781	2	18 9 17.84	2.6676	23 38 50.8	3.988
3	16 0 46.17	2.7362	23 26 12.4	4.602	3	18 11 57.73	2.6622	23 34 48.0	4.128
4	16 3 30.43	2.7388	23 30 43.2	4.432	4	18 14 37.30	2.6566	23 30 35.3	4.295
5	16 6 14.84	2.7413	23 35 3.1	4.241	5	18 17 16.52	2.6508	23 26 12.7	4.438
6	16 8 59.39	2.7436	23 39 12.1	4.060	6	18 19 55.40	2.6450	23 21 40.2	4.622
7	16 11 44.08	2.7456	23 43 10.2	3.877	7	18 22 33.93	2.6391	23 16 58.1	4.788
8	16 14 28.89	2.7477	23 46 57.3	3.694	8	18 25 12.09	2.6330	23 12 6.3	4.943
9	16 17 13.81	2.7496	23 50 33.4	3.510	9	18 27 49.89	2.6268	23 7 5.0	5.101
10	16 19 58.83	2.7511	23 53 58.5	3.326	10	18 30 27.31	2.6206	23 1 54.2	5.288
11	16 22 43.95	2.7526	23 57 12.5	3.141	11	18 33 4.35	2.6143	22 56 34.0	5.413
12	16 25 29.14	2.7538	24 0 15.4	2.965	12	18 35 41.01	2.6076	22 51 4.6	5.567
13	16 28 14.40	2.7548	24 3 7.1	2.789	13	18 38 17.27	2.6010	22 45 26.0	5.719
14	16 30 59.72	2.7557	24 5 47.7	2.583	14	18 40 53.13	2.5943	22 39 38.3	5.870
15	16 33 45.09	2.7565	24 8 17.0	2.396	15	18 43 28.59	2.5876	22 33 41.6	6.019
16	16 36 30.50	2.7570	24 10 35.2	2.209	16	18 46 3.64	2.5807	22 27 36.0	6.166
17	16 39 15.93	2.7573	24 12 42.2	2.022	17	18 48 38.27	2.5737	22 21 21.6	6.312
18	16 42 1.38	2.7575	24 14 37.9	1.835	18	18 51 12.48	2.5667	22 14 58.6	6.456
19	16 44 46.83	2.7576	24 16 22.4	1.647	19	18 53 46.27	2.5596	22 8 26.9	6.599
20	16 47 32.28	2.7573	24 17 55.6	1.460	20	18 56 19.63	2.5524	22 1 46.7	6.740
21	16 50 17.71	2.7569	24 19 17.6	1.272	21	18 58 52.56	2.5452	21 54 58.1	6.879
22	16 53 3.11	2.7563	24 20 28.3	1.085	22	19 1 25.05	2.5378	21 48 1.2	7.017
23	16 55 48.47	2.7555	S. 24° 21' 27.8"	0.898	23	19 3 57.10	2.5304	S. 21° 40' 56.0"	7.158
MONDAY 2.					WEDNESDAY 4.				
0	16 58 33.77	2.7545	S. 24° 22' 16.1"	0.710	0	19 6 28.70	2.5220	S. 21° 33' 42.8"	7.297
1	17 1 19.01	2.7534	24 22 53.1	0.522	1	19 8 59.85	2.5155	21 26 21.6	7.419
2	17 4 4.18	2.7520	24 23 18.9	0.336	2	19 11 30.56	2.5080	21 18 52.5	7.548
3	17 6 49.26	2.7505	24 23 33.5	0.150	3	19 14 0.81	2.5004	21 11 15.6	7.679
4	17 9 34.24	2.7489	24 23 36.9	0.037	4	19 16 30.61	2.4928	21 3 31.0	7.806
5	17 12 19.11	2.7469	24 23 29.1	0.222	5	19 18 59.95	2.4851	20 55 38.8	7.928
6	17 15 3.87	2.7446	24 23 10.1	0.406	6	19 21 28.62	2.4774	20 47 39.2	8.056
7	17 17 48.50	2.7426	24 22 40.0	0.593	7	19 23 57.24	2.4697	20 39 32.2	8.177
8	17 20 32.98	2.7402	24 21 58.9	0.778	8	19 26 25.19	2.4620	20 31 18.0	8.297
9	17 23 17.32	2.7376	24 21 6.7	0.962	9	19 28 52.67	2.4542	20 22 56.6	8.415
10	17 26 1.49	2.7347	24 20 3.5	1.145	10	19 31 19.69	2.4464	20 14 28.2	8.533
11	17 28 45.49	2.7317	24 18 49.3	1.328	11	19 33 46.24	2.4386	20 5 52.8	8.647
12	17 31 29.30	2.7286	24 17 24.1	1.510	12	19 36 12.32	2.4307	19 57 10.6	8.769
13	17 34 12.92	2.7253	24 15 48.0	1.692	13	19 38 37.93	2.4228	19 48 21.7	8.871
14	17 36 56.33	2.7218	24 14 1.1	1.872	14	19 41 3.06	2.4149	19 39 26.1	8.980
15	17 39 39.53	2.7182	24 12 3.3	2.052	15	19 43 27.72	2.4071	19 30 24.0	9.088
16	17 42 22.51	2.7143	24 9 54.8	2.231	16	19 45 51.91	2.3992	19 21 15.5	9.194
17	17 45 5.25	2.7103	24 7 35.6	2.409	17	19 48 15.63	2.3913	19 12 0.7	9.298
18	17 47 47.75	2.7063	24 5 5.7	2.586	18	19 50 38.87	2.3834	19 2 39.7	9.401
19	17 50 30.00	2.7019	24 2 25.2	2.763	19	19 53 1.64	2.3756	18 53 12.6	9.502
20	17 53 11.98	2.6974	23 59 34.2	2.938	20	19 55 23.94	2.3677	18 43 39.5	9.601
21	17 55 53.69	2.6928	23 56 32.7	3.112	21	19 57 45.77	2.3598	18 34 0.5	9.698
22	17 58 35.12	2.6881	23 53 20.8	3.284	22	20 0 7.13	2.3521	18 24 15.8	9.793
23	18 1 16.26	2.6832	23 49 58.6	3.455	23	20 2 28.02	2.3443	18 14 25.4	9.886
24	18 3 57.10	2.6780	S. 23° 40' 26.2"	3.626	24	20 4 48.44	2.3365	S. 18° 4' 29.5"	9.978

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	20 4 48.44	2.3266	S. 18° 4' 29.5"	9.978	0	21 48 45.75	2.0177	S. 8° 49' 32.4"	12.001
1	20 7 8.39	2.3267	17 54 28.1	10.008	1	21 50 46.66	2.0137	8 36 55.7	12.028
2	20 9 27.88	2.3268	17 44 21.3	10.187	2	21 52 47.27	2.0078	8 24 17.7	12.044
3	20 11 46.90	2.3122	17 34 9.2	10.244	3	21 54 47.59	2.0029	8 11 38.4	12.066
4	20 14 5.46	2.3065	17 23 52.0	10.329	4	21 56 47.62	1.9981	7 58 57.9	12.084
5	20 16 23.55	2.3078	17 13 29.7	10.413	5	21 58 47.36	1.9934	7 46 16.3	12.708
6	20 18 41.19	2.3001	17 3 2.4	10.406	6	22 0 46.83	1.9888	7 33 33.6	12.730
7	20 20 58.37	2.3025	16 52 30.3	10.575	7	22 2 46.02	1.9843	7 20 49.8	12.787
8	20 23 15.09	2.2749	16 41 53.4	10.684	8	22 4 44.94	1.9798	7 8 5.1	12.788
9	20 25 31.36	2.3073	16 31 11.8	10.781	9	22 6 43.60	1.9754	6 55 19.5	12.767
10	20 27 47.17	2.3006	16 20 25.7	10.806	10	22 8 41.99	1.9711	6 42 33.0	12.780
11	20 30 2.54	2.3234	16 9 35.1	10.879	11	22 10 40.13	1.9668	6 29 45.8	12.798
12	20 32 17.46	2.3450	15 58 40.2	10.961	12	22 12 38.01	1.9627	6 16 57.8	12.806
13	20 34 31.94	2.3277	15 47 41.0	11.022	13	22 14 35.65	1.9586	6 4 9.2	12.816
14	20 36 45.98	2.3203	15 36 37.6	11.091	14	22 16 33.04	1.9546	5 51 19.9	12.826
15	20 38 59.58	2.3230	15 25 30.1	11.156	15	22 18 30.20	1.9507	5 38 30.1	12.834
16	20 41 12.74	2.3158	15 14 18.6	11.234	16	22 20 27.13	1.9469	5 25 39.8	12.841
17	20 43 25.47	2.3086	15 3 3.2	11.288	17	22 22 23.83	1.9431	5 12 49.1	12.848
18	20 45 37.77	2.3015	14 51 44.0	11.351	18	22 24 20.30	1.9394	4 59 58.0	12.854
19	20 47 49.65	2.1944	14 40 21.0	11.413	19	22 26 16.56	1.9356	4 47 6.5	12.860
20	20 50 1.10	2.1874	14 28 54.4	11.473	20	22 28 12.60	1.9323	4 34 14.8	12.864
21	20 52 12.13	2.1804	14 17 24.3	11.531	21	22 30 8.43	1.9288	4 21 22.8	12.868
22	20 54 22.75	2.1735	14 5 50.7	11.588	22	22 32 4.06	1.9255	4 8 30.7	12.870
23	20 56 32.95	2.1667	S. 13° 54' 13.7"	11.643	23	22 33 59.49	1.9222	S. 3° 55' 38.4"	12.873
FRIDAY 6.					SUNDAY 8.				
0	20 58 42.75	2.1800	S. 13° 42' 33.5"	11.697	0	22 35 54.72	1.9189	S. 3° 42' 46.0"	12.873
1	21 0 52.14	2.1532	13 30 50.1	11.750	1	22 37 49.76	1.9157	3 29 53.6	12.873
2	21 3 1.13	2.1466	13 19 3.5	11.801	2	22 39 44.61	1.9127	3 17 1.2	12.873
3	21 5 9.73	2.1400	13 7 13.9	11.851	3	22 41 39.28	1.9097	3 4 8.9	12.871
4	21 7 17.93	2.1335	12 55 21.4	11.900	4	22 43 33.78	1.9068	2 51 16.7	12.868
5	21 9 25.74	2.1270	12 43 26.0	11.947	5	22 45 28.10	1.9040	2 38 24.7	12.865
6	21 11 33.17	2.1206	12 31 27.8	11.998	6	22 47 22.26	1.9012	2 25 32.9	12.861
7	21 13 40.22	2.1143	12 19 26.9	12.057	7	22 49 16.25	1.8985	2 12 41.3	12.857
8	21 15 46.89	2.1080	12 7 23.4	12.080	8	22 51 10.08	1.8959	1 59 50.1	12.851
9	21 17 53.18	2.1018	11 55 17.3	12.122	9	22 53 3.75	1.8933	1 46 59.3	12.844
10	21 19 59.11	2.0957	11 43 8.8	12.169	10	22 54 57.28	1.8909	1 34 8.8	12.837
11	21 22 4.67	2.0897	11 30 57.9	12.201	11	22 56 50.66	1.8885	1 21 18.7	12.830
12	21 24 9.88	2.0837	11 18 44.7	12.239	12	22 58 43.90	1.8862	1 8 29.2	12.821
13	21 26 14.73	2.0778	11 6 29.2	12.276	13	23 0 37.00	1.8839	0 55 40.2	12.812
14	21 28 19.22	2.0720	10 54 11.6	12.311	14	23 2 29.97	1.8816	0 42 51.8	12.802
15	21 30 23.37	2.0662	10 41 51.9	12.345	15	23 4 22.82	1.8797	0 30 4.0	12.793
16	21 32 27.17	2.0605	10 29 30.2	12.378	16	23 6 15.54	1.8777	0 17 16.8	12.780
17	21 34 30.63	2.0549	10 17 6.5	12.410	17	23 8 8.14	1.8758	S. 0° 4' 30.4"	12.767
18	21 36 33.76	2.0494	10 4 41.0	12.441	18	23 10 0.63	1.8740	N. 0° 8' 15.3"	12.754
19	21 38 36.56	2.0439	9 52 13.7	12.470	19	23 11 53.01	1.8722	0 21 0.2	12.741
20	21 40 39.03	2.0385	9 39 44.6	12.498	20	23 13 45.29	1.8706	0 33 44.2	12.737
21	21 42 41.18	2.0332	9 27 13.9	12.525	21	23 15 37.47	1.8688	0 46 27.4	12.713
22	21 44 43.01	2.0280	9 14 41.6	12.552	22	23 17 29.55	1.8672	0 59 9.6	12.696
23	21 46 44.53	2.0228	9 2 7.7	12.577	23	23 19 21.54	1.8657	1 11 50.9	12.680
24	21 48 45.75	2.0177	S. 8° 49' 32.4"	12.601	24	23 21 13.44	1.8643	N. 1° 24' 31.2"	12.663

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	23 21 13.44	1.8643	N. 1° 24' 31.2"	12.663	0	0 50 21.21	1.8728	N. 11° 0' 33.4"	11.190
1	23 23 5.26	1.8630	1 37 10.4	12.645	1	0 52 13.68	1.8754	11 11 37.9	11.082
2	23 24 57.00	1.8617	1 49 48.6	12.627	2	0 54 6.26	1.8771	11 22 39.6	11.003
3	23 26 48.66	1.8604	2 2 25.7	12.608	3	0 55 58.94	1.8788	11 33 38.3	10.954
4	23 28 40.25	1.8593	2 15 1.6	12.588	4	0 57 51.73	1.8807	11 44 34.1	10.904
5	23 30 31.77	1.8582	2 27 36.3	12.568	5	0 59 44.62	1.8825	11 55 26.9	10.854
6	23 32 23.23	1.8572	2 40 9.8	12.547	6	1 1 37.63	1.8844	12 6 16.6	10.803
7	23 34 14.63	1.8562	2 52 42.0	12.526	7	1 3 30.75	1.8863	12 17 3.3	10.752
8	23 36 5.98	1.8544	3 5 12.8	12.503	8	1 5 23.99	1.8883	12 27 46.9	10.700
9	23 37 57.28	1.8546	3 17 42.3	12.480	9	1 7 17.35	1.8904	12 38 27.3	10.647
10	23 39 48.53	1.8539	3 30 10.4	12.456	10	1 9 10.84	1.8926	12 49 4.6	10.593
11	23 41 39.74	1.8532	3 42 37.1	12.432	11	1 11 4.46	1.8947	12 59 38.6	10.539
12	23 43 30.92	1.8526	3 55 2.3	12.407	12	1 12 58.21	1.8969	13 10 9.3	10.484
13	23 45 22.06	1.8521	4 7 26.0	12.382	13	1 14 52.09	1.8992	13 20 36.7	10.429
14	23 47 13.17	1.8517	4 19 48.1	12.356	14	1 16 46.11	1.9015	13 31 0.8	10.373
15	23 49 4.26	1.8513	4 32 8.7	12.329	15	1 18 40.26	1.9038	13 41 21.6	10.317
16	23 50 55.33	1.8510	4 44 27.6	12.301	16	1 20 34.56	1.9063	13 51 38.9	10.260
17	23 52 46.38	1.8507	4 56 44.8	12.273	17	1 22 29.00	1.9086	14 1 52.8	10.202
18	23 54 37.42	1.8505	5 9 0.4	12.245	18	1 24 23.59	1.9110	14 12 3.2	10.143
19	23 56 28.45	1.8504	5 21 14.2	12.216	19	1 26 18.33	1.9135	14 22 10.0	10.084
20	23 58 19.47	1.8504	5 33 26.3	12.186	20	1 28 13.21	1.9160	14 32 13.3	10.024
21	0 0 10.49	1.8504	5 45 36.5	12.155	21	1 30 8.25	1.9186	14 42 12.9	9.963
22	0 2 1.52	1.8505	5 57 44.9	12.124	22	1 32 3.44	1.9212	14 52 8.9	9.902
23	0 3 52.56	1.8507	N. 6 9 51.4	12.092	23	1 33 58.79	1.9239	N. 15 2 1.2	9.841
TUESDAY 10.					THURSDAY 12.				
0	0 5 43.60	1.8508	N. 6 21 56.0	12.060	0	1 35 54.31	1.9266	N. 15 11 49.8	9.778
1	0 7 34.66	1.8511	6 33 58.6	12.027	1	1 37 49.99	1.9293	15 21 34.6	9.715
2	0 9 25.73	1.8514	6 45 59.2	11.993	2	1 39 45.83	1.9321	15 31 15.6	9.651
3	0 11 16.83	1.8518	6 57 57.8	11.959	3	1 41 41.84	1.9349	15 40 52.7	9.587
4	0 13 7.95	1.8522	7 9 54.3	11.924	4	1 43 38.02	1.9378	15 50 26.0	9.522
5	0 14 59.10	1.8527	7 21 48.7	11.889	5	1 45 34.37	1.9407	15 59 55.2	9.456
6	0 16 50.28	1.8533	7 33 41.0	11.853	6	1 47 30.90	1.9436	16 9 20.7	9.389
7	0 18 41.50	1.8539	7 45 31.1	11.816	7	1 49 27.60	1.9465	16 18 42.0	9.322
8	0 20 32.75	1.8546	7 57 18.9	11.779	8	1 51 24.48	1.9495	16 27 59.3	9.254
9	0 22 24.05	1.8554	8 9 4.5	11.741	9	1 53 21.54	1.9525	16 37 12.5	9.186
10	0 24 15.40	1.8562	8 20 47.8	11.703	10	1 55 18.78	1.9555	16 46 21.5	9.116
11	0 26 6.80	1.8571	8 32 28.8	11.664	11	1 57 16.20	1.9585	16 55 26.4	9.046
12	0 27 58.25	1.8581	8 44 7.5	11.624	12	1 59 13.80	1.9616	17 4 27.0	8.975
13	0 29 49.76	1.8591	8 55 43.8	11.584	13	2 1 11.59	1.9647	17 13 23.4	8.904
14	0 31 41.34	1.8601	9 7 17.6	11.543	14	2 3 9.57	1.9678	17 22 15.5	8.832
15	0 33 32.98	1.8612	9 18 48.9	11.501	15	2 5 7.74	1.9710	17 31 3.2	8.759
16	0 35 24.68	1.8624	9 30 17.7	11.459	16	2 7 6.09	1.9742	17 39 46.6	8.686
17	0 37 16.46	1.8636	9 41 43.9	11.416	17	2 9 4.64	1.9774	17 48 25.5	8.612
18	0 39 8.31	1.8649	9 53 7.6	11.373	18	2 11 3.38	1.9806	17 57 0.0	8.537
19	0 41 0.24	1.8662	10 4 28.7	11.329	19	2 13 2.32	1.9838	18 5 30.0	8.462
20	0 42 52.26	1.8676	10 15 47.1	11.284	20	2 15 1.45	1.9871	18 13 55.4	8.385
21	0 44 44.36	1.8691	10 27 2.8	11.239	21	2 17 0.78	1.9904	18 22 16.2	8.308
22	0 46 36.55	1.8706	10 38 15.8	11.193	22	2 19 0.30	1.9937	18 30 32.4	8.230
23	0 48 28.83	1.8722	10 49 26.0	11.147	23	2 21 0.02	1.9971	18 38 43.9	8.152
24	0 50 21.21	1.8738	N. 11 0 33.4	11.100	24	2 22 59.95	2.0004	N. 18 46 50.7	8.073

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	2 22 59.95	2.0004	N.18° 46' 50.7	6.073	0	4 2 54.32	2.1073	N.23° 30' 27.7	2.493
1	2 25 0.07	2.0008	18 54 52.7	7.804	1	4 5 3.84	2.1080	23 33 54.0	2.383
2	2 27 0.40	2.0012	19 2 50.0	7.914	2	4 7 13.51	2.1085	23 37 13.6	2.273
3	2 29 0.93	2.0106	19 10 42.4	7.883	3	4 9 23.34	2.1081	23 40 26.6	2.161
4	2 31 1.67	2.0139	19 18 30.0	7.751	4	4 11 33.32	2.1077	23 43 32.9	2.049
5	2 33 2.61	2.0173	19 26 12.6	7.609	5	4 13 43.46	2.1072	23 46 32.4	2.936
6	2 35 3.75	2.0207	19 33 50.3	7.468	6	4 15 53.74	2.1068	23 49 25.2	2.823
7	2 37 5.10	2.0242	19 41 22.9	7.303	7	4 18 4.17	2.1060	23 52 11.2	2.709
8	2 39 6.66	2.0277	19 48 50.5	7.117	8	4 20 14.74	2.1074	23 54 50.3	2.596
9	2 41 8.43	2.0313	19 56 13.0	7.823	9	4 22 25.46	2.1079	23 57 22.6	2.483
10	2 43 10.40	2.0346	20 3 30.3	7.946	10	4 24 36.31	2.1080	23 59 48.1	2.367
11	2 45 12.58	2.0380	20 10 42.5	7.180	11	4 26 47.29	2.1042	24 2 6.7	2.252
12	2 47 14.96	2.0415	20 17 49.4	7.072	12	4 28 58.41	2.1084	24 4 18.4	2.136
13	2 49 17.55	2.0449	20 24 51.1	6.984	13	4 31 9.06	2.1085	24 6 23.1	2.021
14	2 51 20.35	2.0484	20 31 47.5	6.895	14	4 33 21.03	2.1006	24 8 20.9	1.906
15	2 53 23.36	2.0518	20 38 38.5	6.806	15	4 35 32.53	2.1027	24 10 11.7	1.798
16	2 55 26.57	2.0553	20 45 24.2	6.716	16	4 37 44.15	2.1046	24 11 55.5	1.671
17	2 57 29.99	2.0587	20 52 4.5	6.626	17	4 39 55.88	2.1065	24 13 32.2	1.548
18	2 59 33.61	2.0622	20 58 39.3	6.534	18	4 42 7.73	2.1083	24 15 1.9	1.436
19	3 1 37.44	2.0656	21 5 8.6	6.442	19	4 44 19.68	2.2001	24 16 24.5	1.317
20	3 3 41.48	2.0690	21 11 32.3	6.349	20	4 46 31.74	2.2018	24 17 40.0	1.199
21	3 5 45.72	2.0723	21 17 50.5	6.256	21	4 48 43.90	2.2036	24 18 48.4	1.081
22	3 7 50.16	2.0758	21 24 3.0	6.162	22	4 50 56.16	2.2051	24 19 49.7	0.963
23	3 9 54.81	2.0792	N.21° 30' 9.9	6.068	23	4 53 8.52	2.2067	N.24° 20' 43.8	0.843
SATURDAY 14.					MONDAY 16.				
0	3 11 59.66	2.0826	N.21° 36' 11.1	5.972	0	4 55 20.96	2.2081	N.24° 21' 30.8	0.723
1	3 14 4.71	2.0860	21 42 6.5	5.876	1	4 57 33.49	2.2095	24 22 10.6	0.603
2	3 16 9.97	2.0893	21 47 56.2	5.779	2	4 59 46.10	2.2109	24 22 43.2	0.483
3	3 18 15.43	2.0927	21 53 40.0	5.681	3	5 1 58.79	2.2122	24 23 8.6	0.363
4	3 20 21.09	2.0960	21 59 17.9	5.583	4	5 4 11.56	2.2134	24 23 26.7	0.243
5	3 22 26.95	2.0993	22 4 50.0	5.485	5	5 6 24.40	2.2146	24 23 37.6	0.123
6	3 24 33.01	2.1026	22 10 16.1	5.385	6	5 8 37.30	2.2158	24 23 41.3	0.001
7	3 26 39.27	2.1060	22 15 36.2	5.285	7	5 10 50.27	2.2167	24 23 37.7	0.190
8	3 28 45.72	2.1092	22 20 50.3	5.184	8	5 13 3.30	2.2176	24 23 26.9	0.941
9	3 30 52.37	2.1124	22 25 58.3	5.083	9	5 15 16.38	2.2184	24 23 8.7	0.863
10	3 32 59.21	2.1156	22 31 0.3	4.981	10	5 17 29.51	2.2198	24 22 43.3	0.484
11	3 35 6.24	2.1188	22 35 56.1	4.879	11	5 19 42.69	2.2201	24 22 10.6	0.606
12	3 37 13.47	2.1220	22 40 45.8	4.776	12	5 21 55.92	2.2208	24 21 30.6	0.727
13	3 39 20.89	2.1252	22 45 29.2	4.672	13	5 24 9.19	2.2214	24 20 43.3	0.849
14	3 41 28.49	2.1283	22 50 6.4	4.568	14	5 26 22.49	2.2220	24 19 48.7	0.971
15	3 43 36.27	2.1313	22 54 37.4	4.463	15	5 28 35.83	2.2225	24 18 46.8	1.093
16	3 45 44.24	2.1345	22 59 2.0	4.358	16	5 30 49.19	2.2229	24 17 37.5	1.215
17	3 47 52.39	2.1373	23 3 20.3	4.253	17	5 33 2.58	2.2233	24 16 20.9	1.337
18	3 50 0.72	2.1406	23 7 32.2	4.146	18	5 35 15.99	2.2236	24 14 57.1	1.459
19	3 52 9.23	2.1432	23 11 37.7	4.038	19	5 37 29.41	2.2238	24 13 26.0	1.580
20	3 54 17.91	2.1461	23 15 36.7	3.930	20	5 39 42.85	2.2240	24 11 47.5	1.702
21	3 56 26.76	2.1490	23 19 29.3	3.823	21	5 41 56.30	2.2242	24 10 1.7	1.824
22	3 58 35.78	2.1517	23 23 15.3	3.713	22	5 44 9.75	2.2242	24 8 8.6	1.946
23	4 0 44.97	2.1545	23 26 54.8	3.605	23	5 46 23.20	2.2242	24 6 8.2	2.068
24	4 2 54.32	2.1573	N.23° 30' 27.7	3.498	24	5 48 36.65	2.2241	N.24° 4' 0.4	2.190

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	5 48 36.65	2.2941	N.24° 4' 0.4"	2.180	0	7 34 12.37	2.1684	N.20° 3' 9.9"	2.801
1	5 50 50.10	2.2940	24 1 45.3	2.212	1	7 36 21.80	2.1681	19 55 25.4	2.793
2	5 53 3.53	2.2928	23 59 23.0	2.424	2	7 38 31.10	2.1688	19 47 34.7	2.786
3	5 55 16.95	2.2925	23 56 53.3	2.555	3	7 40 40.26	2.1616	19 39 37.9	2.787
4	5 57 30.35	2.2921	23 54 16.4	2.676	4	7 42 49.28	2.1498	19 31 35.1	2.807
5	5 59 43.73	2.2927	23 51 32.2	2.797	5	7 44 58.17	2.1470	19 23 26.3	2.197
6	6 1 57.08	2.2922	23 48 40.7	2.918	6	7 47 6.92	2.1447	19 15 11.5	2.206
7	6 4 10.40	2.2917	23 45 42.0	3.089	7	7 49 15.53	2.1423	19 6 50.7	2.206
8	6 6 23.69	2.2912	23 42 36.0	3.180	8	7 51 24.00	2.1400	18 58 24.1	2.402
9	6 8 36.94	2.2906	23 39 22.8	3.261	9	7 53 32.33	2.1377	18 49 51.6	2.500
10	6 10 50.16	2.2910	23 36 2.3	3.401	10	7 55 40.52	2.1353	18 41 13.4	2.606
11	6 13 3.33	2.2912	23 32 34.6	3.621	11	7 57 48.57	2.1329	18 32 29.4	2.703
12	6 15 16.46	2.2914	23 28 59.8	3.841	12	7 59 56.47	2.1306	18 23 39.6	2.878
13	6 17 29.54	2.2915	23 25 17.7	3.761	13	8 2 4.23	2.1282	18 14 44.2	2.970
14	6 19 42.56	2.2916	23 21 28.5	3.890	14	8 4 11.86	2.1259	18 5 43.2	2.988
15	6 21 55.52	2.2918	23 17 32.1	3.900	15	8 6 19.35	2.1236	17 56 36.6	2.156
16	6 24 8.42	2.2914	23 13 28.6	4.118	16	8 8 26.69	2.1212	17 47 24.5	2.247
17	6 26 21.25	2.2918	23 9 18.0	4.287	17	8 10 33.89	2.1188	17 38 6.9	2.308
18	6 28 34.02	2.2912	23 5 0.2	4.345	18	8 12 40.95	2.1165	17 28 43.9	2.420
19	6 30 46.72	2.2910	23 0 35.3	4.473	19	8 14 47.87	2.1142	17 19 15.5	2.516
20	6 32 59.34	2.2907	22 56 3.4	4.590	20	8 16 54.65	2.1119	17 9 41.7	2.607
21	6 35 11.88	2.2904	22 51 24.5	4.707	21	8 19 1.29	2.1096	17 0 2.6	2.686
22	6 37 24.35	2.2907	22 46 38.5	4.824	22	8 21 7.80	2.1073	16 50 18.2	2.763
23	6 39 36.74	2.2907	N.22° 41' 45.6"	4.940	23	8 23 14.17	2.1050	N.16° 40' 28.6"	2.800
WEDNESDAY 18.					FRIDAY 20.				
0	6 41 49.04	2.2942	N.22° 36' 45.7"	5.066	0	8 25 20.40	2.1097	N.16° 30' 33.9"	2.866
1	6 44 1.25	2.2927	22 31 38.8	5.172	1	8 27 26.49	2.1004	16 20 34.0	2.940
2	6 46 13.37	2.2912	22 26 25.0	5.287	2	8 29 32.45	2.0982	16 10 29.1	2.954
3	6 48 25.40	2.1907	22 21 4.3	5.402	3	8 31 38.28	2.0960	16 0 19.1	2.980
4	6 50 37.33	2.1901	22 15 36.8	5.516	4	8 33 43.97	2.0938	15 50 4.1	2.980
5	6 52 49.17	2.1904	22 10 2.4	5.630	5	8 35 49.53	2.0916	15 39 44.2	2.972
6	6 55 0.90	2.1947	22 4 21.2	5.743	6	8 37 54.96	2.0894	15 29 19.4	2.963
7	6 57 12.53	2.1929	21 58 33.2	5.856	7	8 40 0.26	2.0872	15 18 49.8	2.953
8	6 59 24.05	2.1911	21 52 38.5	5.968	8	8 42 5.43	2.0850	15 8 15.4	2.942
9	7 1 35.46	2.1893	21 46 37.0	6.080	9	8 44 10.48	2.0831	14 57 36.3	2.931
10	7 3 46.77	2.1876	21 40 28.9	6.191	10	8 46 15.40	2.0810	14 46 52.5	2.920
11	7 5 57.97	2.1857	21 34 14.1	6.302	11	8 48 20.20	2.0789	14 36 4.1	2.904
12	7 8 9.05	2.1837	21 27 52.6	6.413	12	8 50 24.87	2.0768	14 25 11.2	2.890
13	7 10 20.01	2.1817	21 21 24.5	6.523	13	8 52 29.42	2.0748	14 14 13.7	2.886
14	7 12 30.86	2.1797	21 14 49.9	6.631	14	8 54 33.86	2.0729	14 3 11.8	2.880
15	7 14 41.58	2.1777	21 8 8.8	6.740	15	8 56 38.18	2.0710	13 52 5.4	2.872
16	7 16 52.18	2.1756	21 1 21.1	6.849	16	8 58 42.38	2.0691	13 40 54.7	2.861
17	7 19 2.65	2.1736	20 54 26.9	6.957	17	9 0 46.47	2.0672	13 29 39.7	2.850
18	7 21 13.00	2.1714	20 47 26.3	7.063	18	9 2 50.44	2.0654	13 18 20.4	2.837
19	7 23 23.22	2.1692	20 40 19.3	7.169	19	9 4 54.31	2.0636	13 6 56.9	2.827
20	7 25 33.31	2.1671	20 33 6.0	7.275	20	9 6 58.07	2.0618	12 55 29.2	2.816
21	7 27 43.27	2.1649	20 25 46.3	7.380	21	9 9 1.72	2.0600	12 43 57.4	2.804
22	7 29 53.10	2.1628	20 18 20.4	7.484	22	9 11 5.37	2.0583	12 32 21.5	2.791
23	7 32 2.80	2.1606	20 10 48.3	7.588	23	9 13 8.72	2.0567	12 20 41.6	2.780
24	7 34 12.37	2.1584	N.20° 3' 9.9"	7.691	24	9 15 12.07	2.0550	N.12° 8' 57.8"	2.763

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	9 15 12.07	2.0660	N. 12° 6' 57.8"	11.763	0	10 52 55.18	2.0680	N. 1° 46' 4.1"	13.899
1	9 17 15.32	2.0634	11 57 10.0	11.938	1	10 54 57.55	2.0403	1 32 13.8	13.848
2	9 19 18.48	2.0619	11 45 18.4	11.891	2	10 57 0.00	2.0415	1 18 22.3	13.806
3	9 21 21.55	2.0604	11 33 23.0	11.904	3	10 59 2.53	2.0428	1 4 29.8	13.864
4	9 23 24.53	2.0490	11 21 23.9	12.916	4	11 1 5.14	2.0442	0 50 36.2	13.901
5	9 25 27.43	2.0476	11 9 21.1	12.077	5	11 3 7.84	2.0457	0 36 41.7	13.916
6	9 27 30.24	2.0463	10 57 14.6	12.186	6	11 5 10.63	2.0473	0 22 46.3	13.930
7	9 29 32.97	2.0449	10 45 4.6	12.197	7	11 7 13.52	2.0489	N. 0 8 50.1	13.943
8	9 31 35.63	2.0436	10 32 51.0	12.965	8	11 9 16.50	2.0505	S. 0 5 6.8	13.964
9	9 33 38.91	2.0424	10 20 33.9	12.313	9	11 11 19.59	2.0524	0 19 4.4	13.985
10	9 35 40.72	2.0412	10 8 13.4	12.970	10	11 13 22.79	2.0543	0 33 2.6	13.974
11	9 37 43.16	2.0401	9 55 49.5	12.426	11	11 15 26.11	2.0562	0 47 1.4	13.983
12	9 39 45.53	2.0390	9 43 22.3	12.480	12	11 17 29.54	2.0582	1 1 0.6	13.991
13	9 41 47.84	2.0380	9 30 51.9	12.534	13	11 19 33.10	2.0603	1 15 0.3	13.997
14	9 43 50.09	2.0370	9 18 18.2	12.587	14	11 21 36.78	2.0626	1 29 0.3	14.003
15	9 45 52.28	2.0361	9 5 41.4	12.639	15	11 23 40.60	2.0647	1 43 0.6	14.007
16	9 47 54.42	2.0353	8 53 1.5	12.690	16	11 25 44.55	2.0671	1 57 1.2	14.010
17	9 49 56.50	2.0345	8 40 18.5	12.741	17	11 27 48.65	2.0696	2 11 1.9	14.012
18	9 51 58.54	2.0338	8 27 32.6	12.790	18	11 29 52.89	2.0720	2 25 2.7	14.013
19	9 54 0.54	2.0332	8 14 43.7	12.838	19	11 31 57.28	2.0745	2 39 3.5	14.012
20	9 56 2.49	2.0326	8 1 52.0	12.886	20	11 34 1.83	2.0771	2 53 4.2	14.011
21	9 58 4.41	2.0317	7 48 57.4	12.932	21	11 36 6.54	2.0798	3 7 4.8	14.008
22	10 0 6.29	2.0311	7 36 0.1	12.978	22	11 38 11.41	2.0826	3 21 5.2	14.006
23	10 2 8.14	2.0306	N. 7 23 0.0	12.028	23	11 40 16.45	2.0854	S. 3 35 5.4	14.000
SUNDAY 22.					TUESDAY 24.				
0	10 4 9.96	2.0303	N. 7 9 57.3	12.067	0	11 42 21.66	2.0883	S. 3 49 5.2	13.994
1	10 6 11.76	2.0298	6 56 52.0	12.110	1	11 44 27.05	2.0913	4 3 4.6	13.986
2	10 8 13.54	2.0294	6 43 44.1	12.152	2	11 46 32.62	2.0944	4 17 3.5	13.977
3	10 10 15.30	2.0292	6 30 33.8	12.193	3	11 48 38.37	2.0976	4 31 1.9	13.967
4	10 12 17.05	2.0290	6 17 21.0	12.233	4	11 50 44.32	2.1008	4 44 59.6	13.956
5	10 14 18.79	2.0289	6 4 5.9	12.273	5	11 52 50.46	2.1041	4 58 56.6	13.944
6	10 16 20.52	2.0288	5 50 48.4	12.310	6	11 54 56.81	2.1076	5 12 52.9	13.931
7	10 18 22.25	2.0288	5 37 28.7	12.347	7	11 57 3.36	2.1109	5 26 48.4	13.917
8	10 20 23.98	2.0289	5 24 6.7	12.383	8	11 59 10.12	2.1144	5 40 42.9	13.900
9	10 22 25.72	2.0291	5 10 42.6	12.418	9	12 1 17.09	2.1180	5 54 36.4	13.882
10	10 24 27.47	2.0293	4 57 16.5	12.453	10	12 3 24.28	2.1217	6 8 28.8	13.864
11	10 26 29.23	2.0296	4 43 48.3	12.487	11	12 5 31.70	2.1255	6 22 20.1	13.845
12	10 28 31.01	2.0299	4 30 18.1	12.519	12	12 7 39.34	2.1293	6 36 10.2	13.824
13	10 30 32.81	2.0303	4 16 46.0	12.550	13	12 9 47.21	2.1333	6 49 59.0	13.803
14	10 32 34.64	2.0307	4 3 12.1	12.580	14	12 11 55.32	2.1373	7 3 46.4	13.778
15	10 34 36.49	2.0312	3 49 36.4	12.610	15	12 14 3.67	2.1413	7 17 32.3	13.753
16	10 36 38.38	2.0316	3 35 58.9	12.639	16	12 16 12.27	2.1453	7 31 16.7	13.727
17	10 38 40.30	2.0324	3 22 19.8	12.665	17	12 18 21.11	2.1495	7 44 59.5	13.699
18	10 40 42.27	2.0332	3 8 39.1	12.692	18	12 20 30.21	2.1538	7 58 40.6	13.670
19	10 42 44.29	2.0340	2 54 56.8	12.717	19	12 22 39.56	2.1581	8 12 19.9	13.639
20	10 44 46.35	2.0349	2 41 13.0	12.743	20	12 24 49.18	2.1625	8 25 57.3	13.607
21	10 46 48.47	2.0358	2 27 27.8	12.768	21	12 26 59.06	2.1669	8 39 32.8	13.574
22	10 48 50.64	2.0368	2 13 41.2	12.793	22	12 29 9.21	2.1715	8 53 6.2	13.540
23	10 50 52.88	2.0378	1 59 53.3	12.809	23	12 31 19.64	2.1761	9 6 37.5	13.504
24	10 52 55.18	2.0390	N. 1 46 4.1	12.829	24	12 33 30.34	2.1808	S. 9 20 6.7	13.467

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	12 ^h 33 ^m 30.34	2.1808	S. 9° 20' 6.7	13.467	0	14 ^h 24 ^m 39.44	2.4652	S. 18° 54' 29.7	9.843
1	12 35 41.33	2.1866	9 33 33.6	13.428	1	14 27 7.54	2.4716	19 4 16.8	9.736
2	12 37 52.60	2.1903	9 46 58.1	13.388	2	14 29 36.03	2.4780	19 13 56.8	9.686
3	12 40 4.17	2.1962	10 0 20.1	13.346	3	14 32 4.90	2.4843	19 23 29.7	9.606
4	12 42 16.03	2.2003	10 13 39.6	13.303	4	14 34 34.15	2.4897	19 32 55.3	9.586
5	12 44 28.19	2.2049	10 26 56.5	13.266	5	14 37 3.78	2.4971	19 42 13.6	9.543
6	12 46 40.66	2.2104	10 40 10.6	13.212	6	14 39 33.80	2.5034	19 51 24.5	9.416
7	12 48 53.44	2.2166	10 53 21.9	13.166	7	14 42 4.20	2.5097	20 0 27.9	9.393
8	12 51 6.53	2.2208	11 6 30.4	13.116	8	14 44 34.97	2.5160	20 9 23.6	9.364
9	12 53 19.94	2.2261	11 19 35.9	13.066	9	14 47 6.11	2.5223	20 18 11.6	9.336
10	12 55 33.66	2.2314	11 32 38.3	13.014	10	14 49 37.63	2.5284	20 26 51.8	9.604
11	12 57 47.70	2.2368	11 45 37.5	12.960	11	14 52 9.52	2.5346	20 35 24.1	9.471
12	13 0 2.07	2.2422	11 58 33.5	12.906	12	14 54 41.77	2.5406	20 43 48.3	9.336
13	13 2 16.77	2.2477	12 11 26.2	12.849	13	14 57 14.39	2.5466	20 52 4.4	9.200
14	13 4 31.80	2.2533	12 24 15.4	12.791	14	14 59 47.36	2.5526	21 0 12.3	9.063
15	13 6 47.17	2.2589	12 37 1.1	12.731	15	15 2 20.69	2.5584	21 8 11.9	7.923
16	13 9 2.87	2.2646	12 49 43.1	12.670	16	15 4 54.37	2.5642	21 16 3.1	7.793
17	13 11 18.92	2.2703	13 2 21.5	12.607	17	15 7 28.40	2.5700	21 23 45.8	7.640
18	13 13 35.31	2.2761	13 14 56.0	12.543	18	15 10 2.77	2.5757	21 31 19.9	7.497
19	13 15 52.05	2.2820	13 27 26.6	12.477	19	15 12 37.48	2.5813	21 38 45.4	7.353
20	13 18 9.15	2.2879	13 39 53.2	12.409	20	15 15 12.53	2.5868	21 46 2.1	7.206
21	13 20 26.60	2.2938	13 52 15.7	12.340	21	15 17 47.91	2.5923	21 53 9.9	7.066
22	13 22 44.40	2.2998	14 4 34.0	12.269	22	15 20 23.61	2.5977	22 0 8.8	6.927
23	13 25 2.56	2.3056	S. 14° 16' 48.0	12.197	23	15 22 59.63	2.6030	S. 22° 6' 58.7	6.786
THURSDAY 26.					SATURDAY 28.				
0	13 27 21.09	2.3119	S. 14° 28' 57.6	12.133	0	15 25 35.97	2.6082	S. 22° 13' 39.5	6.603
1	13 29 39.99	2.3180	14 41 2.7	12.047	1	15 28 12.02	2.6133	22 20 11.1	6.449
2	13 31 59.25	2.3241	14 53 3.2	11.970	2	15 30 49.57	2.6183	22 26 33.4	6.294
3	13 34 18.88	2.3303	15 4 59.0	11.891	3	15 33 26.82	2.6233	22 32 46.3	6.137
4	13 36 38.88	2.3366	15 16 50.1	11.810	4	15 36 4.36	2.6281	22 38 49.8	5.979
5	13 38 59.26	2.3428	15 28 36.2	11.737	5	15 38 42.19	2.6328	22 44 43.8	5.820
6	13 41 20.02	2.3491	15 40 17.4	11.643	6	15 41 20.30	2.6374	22 50 28.2	5.660
7	13 43 41.16	2.3554	15 51 53.5	11.558	7	15 43 58.68	2.6418	22 56 2.9	5.497
8	13 46 2.67	2.3618	16 3 24.4	11.471	8	15 46 37.32	2.6462	23 1 27.9	5.336
9	13 48 24.57	2.3683	16 14 50.0	11.382	9	15 49 16.22	2.6506	23 6 43.1	5.171
10	13 50 46.85	2.3745	16 26 10.2	11.291	10	15 51 55.38	2.6546	23 11 48.4	5.007
11	13 53 9.51	2.3809	16 37 24.9	11.198	11	15 54 34.78	2.6586	23 16 43.8	4.841
12	13 55 32.56	2.3873	16 48 34.0	11.104	12	15 57 14.41	2.6626	23 21 29.3	4.674
13	13 57 56.00	2.3938	16 59 37.4	11.008	13	15 59 54.27	2.6663	23 26 4.7	4.505
14	14 0 19.82	2.4003	17 10 35.0	10.911	14	16 2 34.35	2.6698	23 30 29.9	4.336
15	14 2 44.03	2.4067	17 21 26.8	10.812	15	16 5 14.64	2.6732	23 34 45.0	4.166
16	14 5 8.63	2.4132	17 32 12.5	10.711	16	16 7 55.14	2.6766	23 38 49.8	3.996
17	14 7 33.62	2.4197	17 42 52.1	10.608	17	16 10 35.83	2.6797	23 42 44.4	3.823
18	14 9 59.00	2.4262	17 53 25.5	10.504	18	16 13 16.70	2.6827	23 46 28.6	3.650
19	14 12 24.77	2.4327	18 3 52.6	10.398	19	16 15 57.75	2.6856	23 50 2.4	3.477
20	14 14 50.92	2.4392	18 14 13.3	10.290	20	16 18 38.96	2.6883	23 53 25.8	3.303
21	14 17 17.46	2.4457	18 24 27.5	10.181	21	16 21 20.33	2.6908	23 56 38.7	3.126
22	14 19 44.40	2.4522	18 34 35.0	10.069	22	16 24 1.86	2.6933	23 59 41.1	2.952
23	14 22 11.73	2.4587	18 44 35.8	9.966	23	16 26 43.53	2.6956	24 2 32.9	2.776
24	14 24 39.44	2.4652	S. 18° 54' 29.7	9.843	24	16 29 25.33	2.6977	S. 24° 5' 14.2	2.599

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					TUESDAY 31.				
0	16 29 25.33	2.6977	8.24 5 14.2	2.599	0	18 38 11.06	2.6002	S. 22° 45' 11.6	8.747
1	16 32 7.25	2.6987	24 7 44.8	2.421	1	18 40 47.27	2.6007	22 39 22.1	8.901
2	16 34 49.29	2.7014	24 10 4.7	2.343	2	18 43 23.14	2.6051	22 33 23.5	6.064
3	16 37 31.42	2.7030	24 12 14.0	2.965	3	18 45 58.68	2.6094	22 27 15.7	6.208
4	16 40 13.65	2.7045	24 14 12.5	1.886	4	18 48 33.87	2.6038	22 20 58.9	6.354
5	16 42 55.96	2.7060	24 16 0.2	1.706	5	18 51 8.72	2.6778	22 14 33.2	6.502
6	16 45 38.35	2.7080	24 17 37.2	1.527	6	18 53 43.21	2.6718	22 7 58.6	6.649
7	16 48 20.80	2.7079	24 19 3.4	1.347	7	18 56 17.34	2.6658	22 1 15.2	6.795
8	16 51 3.30	2.7087	24 20 18.8	1.167	8	18 58 51.11	2.6596	21 54 23.2	6.939
9	16 53 45.84	2.7088	24 21 23.4	0.987	9	19 1 24.50	2.6534	21 47 22.6	7.081
10	16 56 28.42	2.7096	24 22 17.2	0.806	10	19 3 57.52	2.6471	21 40 13.5	7.221
11	16 59 11.02	2.7101	24 23 0.1	0.626	11	19 6 30.16	2.6408	21 32 56.0	7.360
12	17 1 53.63	2.7103	24 23 32.2	0.444	12	19 9 2.42	2.6343	21 25 30.3	7.498
13	17 4 36.24	2.7102	24 23 53.4	0.263	13	19 11 34.29	2.6278	21 17 56.3	7.634
14	17 7 18.85	2.7099	24 24 3.8	0.082	14	19 14 5.76	2.6213	21 10 14.2	7.768
15	17 10 1.44	2.7095	24 24 3.3	0.099	15	19 16 36.84	2.6147	21 2 24.1	7.900
16	17 12 43.99	2.7089	24 23 52.0	0.379	16	19 19 7.52	2.6080	20 54 26.2	8.031
17	17 15 26.51	2.7082	24 23 29.9	0.459	17	19 21 37.79	2.6012	20 46 20.4	8.160
18	17 18 8.97	2.7072	24 22 56.9	0.640	18	19 24 7.66	2.4944	20 38 7.0	8.287
19	17 20 51.37	2.7061	24 22 13.1	0.820	19	19 26 37.12	2.4876	20 29 46.0	8.413
20	17 23 33.70	2.7048	24 21 18.5	1.000	20	19 29 6.17	2.4807	20 21 17.4	8.537
21	17 26 15.95	2.7034	24 20 13.1	1.179	21	19 31 34.80	2.4737	20 12 41.4	8.660
22	17 28 58.11	2.7018	24 18 57.0	1.358	22	19 34 3.01	2.4667	20 3 58.2	8.780
23	17 31 40.17	2.7001	S. 24 17 30.1	1.537	23	19 36 30.80	2.4597	S. 19 55 7.8	8.899
MONDAY 30.					WEDNESDAY, JANUARY 1, 1862.				
0	17 34 22.12	2.6981	S. 24 15 52.6	1.715	0	19 38 58.17	2.4526	S. 19 46 10.3	9.016
1	17 37 3.95	2.6980	24 14 4.4	1.593					
2	17 39 45.64	2.6987	24 12 5.5	2.070					
3	17 42 27.20	2.6913	24 9 56.0	2.347					
4	17 45 8.60	2.6987	24 7 35.9	2.423					
5	17 47 49.84	2.6959	24 5 5.2	2.598					
6	17 50 30.91	2.6930	24 2 24.1	2.772					
7	17 53 11.80	2.6900	23 59 32.5	2.946					
8	17 55 52.51	2.6706	23 56 30.6	3.119					
9	17 58 33.02	2.6734	23 53 18.3	3.291					
10	18 1 13.32	2.6699	23 49 55.7	3.462					
11	18 3 53.40	2.6662	23 46 22.9	3.633					
12	18 6 33.26	2.6624	23 42 39.8	3.802					
13	18 9 12.89	2.6584	23 38 46.6	3.970					
14	18 11 52.27	2.6543	23 34 43.4	4.138					
15	18 14 31.40	2.6501	23 30 30.1	4.304					
16	18 17 10.28	2.6457	23 26 6.9	4.469					
17	18 19 48.89	2.6412	23 21 33.8	4.633					
18	18 22 27.23	2.6366	23 16 50.9	4.796					
19	18 25 5.28	2.6318	23 11 58.2	4.958					
20	18 27 43.05	2.6269	23 6 55.9	5.118					
21	18 30 20.52	2.6219	23 1 44.0	5.277					
22	18 32 57.68	2.6168	22 56 22.6	5.435					
23	18 35 34.53	2.6115	22 50 51.8	5.592					
24	18 38 11.06	2.6062	S. 22 45 11.6	5.747					

PHASES OF THE MOON.

●	New Moon,	d	h	m
☾	First Quarter,	1	14	17.4
○	Full Moon,	8	15	9.7
☾	Last Quarter,	16	20	8.0
●	New Moon,	24	9	52.0
		31	1	54.6

☾	Apogee,	d	h
☾	Perigee,	13	2.0
		29	0.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
3	SUN	W.	19° 32' 8"	2445	21° 14' 38"	2438	22° 56' 50"	2470	24° 38' 45"	2483
	Fomalhaut	E.	62 59 50	2689	61 23 10	2726	59 47 17	2773	58 12 14	2814
	α Pegasi	E.	81 18 19	2253	79 31 11	2289	77 44 26	2286	75 58 4	2264
4	SUN	W.	33 3 22	2561	34 43 10	2579	36 22 34	2597	38 1 33	2615
	Fomalhaut	E.	50 31 21	3065	49 2 29	3126	47 34 56	3199	46 8 46	3275
	α Pegasi	E.	67 12 45	2398	65 29 7	2419	63 45 59	2441	62 3 22	2465
	α Arietis	E.	109 48 13	2256	108 1 9	2273	106 14 29	2289	104 28 14	2307
5	SUN	W.	46 10 7	2713	47 46 30	2723	49 22 27	2752	50 57 58	2772
	Fomalhaut	E.	39 22 27	2776	38 7 0	2807	36 53 46	2854	35 43 0	2882
	α Pegasi	E.	53 39 2	2595	52 0 2	2626	50 21 42	2657	48 44 4	2689
	α Arietis	E.	95 43 26	2398	93 59 48	2417	92 16 37	2435	90 33 52	2455
6	SUN	W.	58 48 50	2875	60 21 41	2885	61 54 6	2916	63 26 5	2936
	α Pegasi	E.	40 47 17	2876	39 14 27	2921	37 42 34	2968	36 11 41	3020
	α Arietis	E.	82 6 55	2551	80 26 52	2569	78 47 15	2589	77 8 5	2607
	Aldebaran	E.	114 52 40	2578	113 13 15	2597	111 34 16	2615	109 55 41	2633
7	SUN	W.	70 59 43	3084	72 29 14	3093	73 58 22	3073	75 27 6	3086
	Venus	W.	24 48 20	3137	26 15 45	3149	27 42 55	3161	29 9 51	3173
	α Arietis	E.	68 58 35	2701	67 21 56	2719	65 45 41	2736	64 9 49	2754
	Aldebaran	E.	101 48 44	2719	100 12 30	2737	98 36 39	2764	97 1 11	2770
8	SUN	W.	82 45 22	3177	84 11 59	3193	85 38 17	3208	87 4 17	3223
	α Aquilæ	W.	44 33 13	3060	45 45 42	3095	46 58 57	3065	48 12 52	3030
	Venus	W.	36 20 47	3226	37 46 11	3252	39 11 19	3265	40 36 11	3278
	α Arietis	E.	56 16 13	2838	54 42 35	2855	53 9 18	2870	51 36 21	2886
	Aldebaran	E.	89 9 10	2880	87 35 47	2898	86 2 44	2900	84 29 59	2894
9	SUN	W.	94 9 55	3294	95 34 14	3306	96 58 18	3319	98 22 8	3330
	α Aquilæ	W.	54 30 13	3709	55 46 51	3692	57 3 47	3676	58 21 0	3663
	Venus	W.	47 36 48	3340	49 0 13	3351	50 23 25	3363	51 46 24	3373
	Aldebaran	E.	76 50 40	2961	75 19 38	2973	73 48 50	2984	72 18 18	2996
	Pollux	E.	118 38 14	2975	117 7 30	2985	115 36 58	2995	114 6 39	3003
10	SUN	W.	105 18 6	3382	106 40 43	3389	108 3 10	3400	109 25 27	3418
	α Aquilæ	W.	64 50 2	3617	66 8 18	3611	67 26 40	3605	68 45 8	3601
	Venus	W.	58 38 29	3420	60 0 23	3429	61 22 7	3437	62 43 42	3443
	Fomalhaut	W.	40 57 22	4196	42 5 52	4129	43 15 23	4076	44 25 48	4027
	Aldebaran	E.	64 49 4	3048	63 19 51	3068	61 50 50	3068	60 22 1	3076
	Pollux	E.	106 37 48	3046	105 8 32	3064	103 39 26	3061	102 10 29	3068
11	α Aquilæ	W.	75 18 33	3586	76 37 23	3583	77 56 16	3581	79 15 11	3581
	Venus	W.	69 29 50	3473	70 50 45	3477	72 11 35	3481	73 32 20	3485
	Fomalhaut	W.	50 28 21	3848	51 42 34	3820	52 57 16	3793	54 12 25	3770
	α Pegasi	W.	27 37 13	3738	28 53 20	3680	30 10 28	3632	31 28 28	3589
	Aldebaran	E.	53 0 28	3116	51 32 38	3134	50 4 57	3131	48 37 25	3136
	Pollux	E.	94 47 36	3095	93 19 20	3101	91 51 11	3104	90 23 6	3109
12	α Aquilæ	W.	85 49 59	3677	87 8 58	3677	88 27 57	3677	89 46 56	3679
	Venus	W.	80 15 14	3497	81 35 41	3498	82 56 7	3499	84 16 32	3498
	Fomalhaut	W.	60 33 37	3678	61 50 47	3664	63 8 13	3649	64 25 55	3636
	α Pegasi	W.	38 8 24	3441	39 29 54	3420	40 51 48	3401	42 14 3	3385
	Aldebaran	E.	41 21 48	3173	39 55 7	3180	38 28 34	3186	37 2 11	3187

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Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
3	SUN W.	26° 20' 23"	2497	26° 1' 40"	2612	29° 42' 37"	2528	31° 23' 11"	2545
	Fomalhaut E.	56 38 4	2606	55 4 49	2604	53 32 35	2664	52 1 24	2608
	α Pegasi E.	74 12 7	2319	72 26 35	2327	70 41 30	2357	68 56 53	2377
4	SUN W.	39 40 8	2684	41 18 17	2688	42 56 0	2672	44 33 17	2692
	Fomalhaut E.	44 44 5	2366	43 20 58	2447	41 59 35	2546	40 40 2	2655
	α Pegasi E.	60 21 19	2499	58 39 51	2616	56 58 59	2540	55 18 42	2667
	α Arietis E.	102 42 24	2324	100 57 0	2343	99 12 2	2361	97 27 31	2379
5	SUN W.	52 33 2	2798	54 7 39	2814	55 41 49	2834	57 15 33	2855
	Fomalhaut E.	34 34 55	2486	33 29 39	2415	32 27 27	2654	31 28 35	2619
	α Pegasi E.	47 7 9	2723	45 30 59	2769	43 55 36	2796	42 21 1	2834
	α Arietis E.	88 51 35	2474	87 9 45	2498	85 28 22	2512	83 47 25	2531
6	SUN W.	64 57 38	2906	66 28 46	2978	67 59 29	2995	69 29 48	3014
	α Pegasi E.	34 41 53	2676	33 13 14	2187	31 45 49	2205	30 19 46	2263
	α Arietis E.	75 29 20	2627	73 51 2	2645	72 13 8	2663	70 35 39	2682
	Aldebaran E.	108 17 31	2680	106 30 44	2687	105 2 20	2686	103 25 21	2702
7	SUN W.	76 55 28	3108	78 23 28	3126	79 51 7	3143	81 18 25	3162
	Venus W.	30 36 33	3185	32 3 0	3196	33 29 11	3211	34 55 7	3225
	α Arietis E.	62 34 21	2771	60 59 15	2786	59 24 32	2806	57 50 12	2822
	Aldebaran E.	95 26 4	2787	93 51 19	2803	92 16 55	2819	90 42 52	2835
8	SUN W.	88 29 59	3220	89 55 23	3253	91 20 30	3265	92 45 21	3281
	α Aquilæ W.	49 27 23	2709	50 42 26	2772	51 57 57	2747	53 13 54	2727
	Venus W.	42 0 48	2391	43 25 10	2394	44 49 17	2316	46 13 10	2329
	α Arietis E.	50 3 44	2901	48 31 26	2916	46 59 27	2931	45 27 47	2946
	Aldebaran E.	82 57 33	2960	81 25 25	2921	79 53 38	2935	78 21 59	2947
9	SUN W.	99 45 45	3341	101 9 9	3362	102 32 20	3363	103 55 19	3373
	α Aquilæ W.	59 38 27	2862	60 56 5	2842	62 18 54	2833	63 31 53	2823
	Venus W.	53 9 12	2383	54 31 48	2388	55 54 12	2403	57 16 25	2411
	Aldebaran E.	70 48 0	2907	69 17 56	2919	67 48 6	2926	66 18 28	2939
	Pollux E.	112 36 30	3013	111 6 33	3023	109 36 48	3030	108 7 13	3039
10	SUN W.	110 47 35	3426	112 9 35	3421	113 31 28	3426	114 53 15	3433
	α Aquilæ W.	70 3 41	2897	71 22 19	2892	72 41 1	2890	73 59 46	2898
	Venus W.	64 5 10	2450	65 26 30	2456	66 47 43	2463	68 8 49	2467
	Fomalhaut W.	45 37 1	2658	46 48 57	2645	48 1 31	2611	49 14 40	2679
	Aldebaran E.	58 53 22	2665	57 24 54	2692	55 56 36	2701	54 28 27	2709
	Pollux E.	100 41 40	2973	99 12 58	2980	97 44 24	2968	96 15 56	2991
11	α Aquilæ W.	80 34 6	2879	81 53 3	2873	83 12 1	2877	84 31 0	2877
	Venus W.	74 53 1	2498	76 13 38	2491	77 34 12	2493	78 54 44	2496
	Fomalhaut W.	55 27 58	2748	56 43 54	2729	58 0 10	2711	59 16 45	2695
	α Pegasi W.	32 47 14	2362	34 6 41	2319	35 26 44	2369	36 47 20	2464
	Aldebaran E.	47 10 1	2145	45 42 46	2132	44 15 39	2156	42 48 40	2164
	Pollux E.	88 55 7	3111	87 27 11	3114	85 59 19	3117	84 31 30	3119
12	α Aquilæ W.	91 5 53	2879	92 24 50	2890	93 43 46	2882	95 2 40	2888
	Venus W.	85 36 58	2499	86 57 23	2499	88 17 48	2498	89 38 14	2498
	Fomalhaut W.	65 43 51	2624	67 2 0	2611	68 20 22	2600	69 38 56	2590
	α Pegasi W.	43 36 37	2369	44 59 29	2344	46 22 38	2340	47 46 3	2327
	Aldebaran E.	35 35 58	2206	34 9 56	2216	32 44 6	2227	31 18 29	2229

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Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	IIIh.	P. L. of DM.	VIh.	P. L. of DM.	IXh.	P. L. of DM.
12	Pollux E.	83° 3' 44"	3131	81° 36' 0"	3134	80° 8' 19"	3126	78° 40' 40"	3126
	Regulus E.	119 59 38	3096	118 31 24	3096	117 8 10	3096	115 34 56	3096
13	α Aquilæ W.	96 21 33	3085	97 40 24	3087	98 59 12	3090	100 17 57	3093
	Venus W.	90 58 40	3497	92 19 7	3496	93 39 37	3492	95 0 10	3499
	Fomalhaut W.	70 57 42	3079	72 16 38	3070	73 35 44	3061	74 55 1	3062
	α Pegasi W.	49 9 43	3315	50 33 37	3304	51 57 44	3294	53 22 2	3286
	Pollux E.	71 22 37	3128	69 55 1	3128	68 27 25	3127	66 59 48	3126
	Regulus E.	108 13 46	3094	106 45 29	3092	105 17 10	3091	103 48 49	3088
14	Venus W.	101 43 38	3475	103 4 30	3471	104 25 26	3467	105 46 27	3463
	Fomalhaut W.	81 33 39	3015	82 53 47	3009	84 14 1	3008	85 34 23	3497
	α Pegasi W.	60 26 22	3288	61 51 46	3281	63 17 20	3222	64 43 3	3214
	Pollux E.	59 41 26	3120	58 13 41	3119	56 45 54	3117	55 18 5	3116
	Regulus E.	96 26 17	3073	94 57 35	3071	93 28 50	3067	92 0 0	3063
	Saturn E.	120 42 19	3119	119 14 32	3113	117 46 38	3107	116 18 37	3101
15	Fomalhaut W.	92 17 36	3474	93 38 29	3470	94 59 27	3467	96 20 28	3465
	α Pegasi W.	71 54 2	3176	73 20 40	3168	74 47 28	3161	76 14 24	3163
	α Arietis W.	28 20 6	3111	29 48 2	3098	31 16 14	3087	32 44 40	3076
	Pollux E.	47 58 34	3109	46 30 35	3108	45 2 35	3108	43 34 35	3108
	Regulus E.	84 34 31	3039	83 5 8	3036	81 35 39	3031	80 6 5	3026
	Saturn E.	108 56 53	3074	107 28 12	3069	105 59 24	3063	104 30 29	3057
	Jupiter E.	112 51 22	3069	111 22 59	3062	109 54 28	3076	108 25 49	3070
16	Fomalhaut W.	103 6 6	3458	104 27 17	3459	105 48 27	3461	107 9 35	3461
	α Pegasi W.	83 31 14	3119	84 59 1	3111	86 26 57	3108	87 55 1	3099
	α Arietis W.	40 10 0	3027	41 39 39	3018	43 9 29	3009	44 39 31	3001
	Pollux E.	36 14 44	3117	34 46 55	3121	33 19 11	3126	31 51 33	3133
	Regulus E.	72 36 31	2997	71 6 15	2993	69 35 53	2986	68 5 23	2977
	Saturn E.	97 4 5	3026	95 34 25	3021	94 4 38	3014	92 34 43	3009
	Jupiter E.	101 0 42	3039	99 31 17	3032	98 1 44	3028	96 32 3	3019
17	α Pegasi W.	95 17 17	3063	96 46 8	3060	98 15 6	3056	99 44 11	3060
	α Arietis W.	52 12 12	2980	53 43 15	2963	55 14 28	2946	56 45 50	2938
	Aldebaran W.	20 26 19	3264	21 51 13	3211	23 17 9	3172	24 43 52	3138
	Regulus E.	60 30 51	2949	58 59 34	2943	57 28 10	2937	55 56 38	2931
	Saturn E.	85 3 4	2974	83 32 19	2968	82 1 26	2961	80 30 24	2954
	Jupiter E.	89 1 33	2963	87 31 1	2978	86 0 21	2971	84 29 32	2964
	Spica E.	114 31 27	2938	112 59 56	2931	111 28 16	2923	109 56 26	2916
18	α Pegasi W.	107 11 16	3022	108 41 1	3018	110 10 51	3016	111 40 45	3011
	α Arietis W.	64 25 15	2997	65 57 38	2989	67 30 11	2980	69 2 55	2973
	Aldebaran W.	32 6 27	3013	33 36 24	2996	35 6 43	2979	36 37 22	2963
	Regulus E.	48 17 2	2901	46 44 44	2894	45 12 18	2887	43 39 43	2883
	Saturn E.	72 53 6	2920	71 21 13	2914	69 49 12	2907	68 17 2	2900
	Jupiter E.	76 53 14	2929	75 21 32	2922	73 49 41	2916	72 17 41	2908
	Spica E.	102 14 54	2879	100 42 8	2871	99 9 12	2864	97 36 8	2866
19	α Arietis W.	76 49 5	2834	78 22 49	2826	79 56 44	2816	81 30 51	2809
	Aldebaran W.	44 15 22	2864	45 47 48	2852	47 20 30	2871	48 53 26	2859
	Regulus E.	35 55 9	2859	34 21 56	2866	32 48 37	2840	31 15 14	2846
	Saturn E.	60 34 5	2868	59 1 5	2862	57 27 57	2856	55 54 40	2848
	Jupiter E.	64 35 25	2873	63 2 31	2866	61 29 28	2859	59 56 16	2861
	Spica E.	89 48 18	2818	88 14 14	2811	86 40 0	2804	85 5 37	2796

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Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXh.	P. L. of Dist.
12	Pollux E.	77° 13' 2"	3136	75° 45' 24"	3136	74° 17' 48"	3136	72° 50' 12"	3136
	Regulus E.	114 6 42	3096	112 38 28	3097	111 10 15	3096	109 42 1	3096
13	α Aquilæ W.	101 36 40	3596	102 55 19	3600	104 13 53	3606	105 32 22	3613
	Venus W.	96 20 46	3498	97 41 24	3498	99 2 5	3492	100 22 49	3478
	Fomalhaut W.	76 14 28	3244	77 34 3	3286	78 53 47	3259	80 13 39	3222
	α Pegasi W.	54 46 31	3275	56 11 12	3265	57 36 4	3255	59 1 8	3247
	Pollux E.	65 32 10	3136	64 4 31	3134	62 36 50	3124	61 9 9	3122
	Regulus E.	102 20 25	3096	100 51 58	3083	99 23 28	3061	97 54 55	3077
14	Venus W.	107 7 33	3456	108 28 44	3484	109 50 0	3448	111 11 22	3442
	Fomalhaut W.	86 54 50	3491	88 15 24	3486	89 36 3	3481	90 56 48	3478
	α Pegasi W.	66 8 56	3205	67 34 59	3198	69 1 11	3190	70 27 32	3183
	Pollux E.	53 50 14	3114	52 22 22	3113	50 54 28	3111	49 26 32	3110
	Regulus E.	90 31 5	3060	89 2 4	3044	87 32 58	3031	86 3 48	3045
	Saturn E.	114 50 29	3066	113 22 15	3023	111 53 54	3066	110 25 27	3060
15	Fomalhaut W.	97 41 31	3463	99 2 37	3461	100 23 45	3459	101 44 55	3466
	α Pegasi W.	77 41 29	3146	79 8 43	3139	80 36 5	3132	82 3 35	3125
	α Arietis W.	34 13 20	3065	35 42 13	3056	37 11 17	3047	38 40 32	3036
	Pollux E.	42 6 35	3108	40 38 34	3100	39 10 35	3110	37 42 38	3113
	Regulus E.	78 36 24	3020	77 6 36	3014	75 36 41	3009	74 6 40	3003
	Saturn E.	103 1 27	3062	101 32 18	3045	100 3 1	3039	98 33 37	3033
	Jupiter E.	106 57 3	3064	105 28 9	3048	103 59 8	3052	102 29 59	3046
16	Fomalhaut W.	108 30 43	3464	109 51 47	3467	111 12 48	3471	112 33 44	3476
	α Pegasi W.	89 23 12	3092	90 51 31	3096	92 19 58	3078	93 48 34	3073
	α Arietis W.	46 9 42	3093	47 40 3	3083	49 10 37	3077	50 41 19	3068
	Pollux E.	30 24 3	3143	28 56 46	3168	27 29 46	3173	26 3 4	3169
	Regulus E.	66 34 42	2973	65 3 56	2967	63 33 2	2961	62 2 0	2955
	Saturn E.	91 4 40	3001	89 34 29	2994	88 4 9	2986	86 33 41	2981
	Jupiter E.	95 2 14	3013	93 32 17	3004	92 2 11	2996	90 31 56	2992
17	α Pegasi W.	101 13 22	3044	102 42 40	3089	104 12 5	3033	105 41 37	3027
	α Arietis W.	58 17 23	2928	59 49 6	2920	61 20 59	2912	62 53 2	2903
	Aldebaran W.	26 11 15	3108	27 39 15	3080	29 7 49	3054	30 36 55	3033
	Regulus E.	54 24 58	2925	52 53 11	2919	51 21 16	2912	49 49 13	2906
	Saturn E.	78 59 13	2947	77 27 54	2941	75 56 27	2934	74 24 51	2927
	Jupiter E.	82 58 34	2966	81 27 28	2950	79 56 12	2942	78 24 47	2936
	Spica E.	108 24 26	2908	106 52 17	2900	105 19 58	2894	103 47 31	2886
18	α Pegasi W.	113 10 44	3007	114 40 48	3003	116 10 57	3000	117 41 10	2997
	α Arietis W.	70 35 48	2866	72 8 52	2857	73 42 6	2849	75 15 30	2841
	Aldebaran W.	38 8 22	2947	39 39 41	2933	41 11 18	2920	42 43 12	2907
	Regulus E.	42 7 2	2877	40 34 14	2871	39 1 18	2860	37 28 17	2862
	Saturn E.	66 44 43	2894	65 12 16	2887	63 39 41	2880	62 6 57	2874
	Jupiter E.	70 45 32	2901	69 13 14	2894	67 40 47	2887	66 8 11	2879
	Spica E.	96 2 53	2849	94 29 29	2842	92 55 55	2836	91 22 12	2826
19	α Arietis W.	83 5 8	2801	84 39 35	2792	86 14 13	2786	87 49 1	2776
	Aldebaran W.	50 26 38	2848	52 0 4	2837	53 33 44	2826	55 7 38	2816
	Regulus E.	29 41 46	2845	28 8 16	2844	26 34 45	2845	25 1 15	2846
	Saturn E.	54 21 15	2841	52 47 42	2837	51 14 2	2831	49 40 15	2827
	Jupiter E.	58 22 54	2844	56 49 23	2838	55 15 44	2831	53 41 57	2826
	Spica E.	83 31 2	2787	81 56 17	2779	80 21 21	2772	78 46 16	2763

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19	Mars E.	116° 3' 26"	2066	114° 34' 35"	2066	113° 5' 32"	2047	111° 36' 18"	2008
20	α Arietis W.	89 24 1	2767	90 59 12	2760	92 34 33	2750	94 10 6	2748
	Aldebaran W.	56 41 45	2805	58 16 6	2795	59 50 41	2785	61 25 29	2774
	Saturn E.	48 6 22	2821	46 32 22	2816	44 58 15	2811	43 24 1	2806
	Jupiter E.	52 8 1	2818	50 33 56	2811	48 59 43	2805	47 25 22	2799
	Spica E.	77 10 59	2754	75 35 31	2746	73 59 52	2738	72 24 2	2730
	Mars E.	104 7 25	2894	102 37 5	2883	101 6 34	2876	99 35 51	2866
21	α Arietis W.	102 10 38	2869	103 47 19	2869	105 24 13	2861	107 1 18	2873
	Aldebaran W.	69 22 49	2724	70 58 57	2714	72 35 18	2704	74 11 52	2694
	Pollux W.	28 4 21	2876	29 37 10	2848	31 10 35	2824	32 44 32	2801
	Saturn E.	35 31 43	2795	33 57 9	2786	32 22 34	2796	30 48 1	2800
	Jupiter E.	39 31 43	2773	37 56 39	2769	36 21 30	2766	34 46 18	2765
	Spica E.	64 22 2	2886	62 45 3	2877	61 7 52	2869	59 30 30	2860
	Mars E.	91 59 20	2820	90 27 26	2810	88 55 20	2801	87 23 2	2800
22	Aldebaran W.	82 18 8	2843	83 56 4	2833	85 34 15	2823	87 12 39	2813
	Pollux W.	40 41 14	2705	42 17 47	2688	43 54 43	2673	45 31 59	2657
	Spica E.	51 20 31	2812	49 41 53	2803	48 3 1	2802	46 23 55	2803
	Mars E.	79 38 15	2840	78 4 39	2829	76 30 49	2818	74 56 44	2807
	SUN E.	120 3 32	2860	118 32 16	2880	117 0 46	2898	115 29 3	2917
23	Aldebaran W.	95 28 14	2860	97 8 4	2850	98 48 8	2838	100 28 28	2828
	Pollux W.	53 43 20	2866	55 22 34	2873	57 2 6	2869	58 41 57	2847
	Regulus W.	16 49 37	2886	18 26 36	2848	20 4 26	2815	21 43 0	2809
	Spica E.	38 5 11	2835	36 24 47	2826	34 44 10	2816	33 3 19	2807
	Mars E.	67 2 51	2763	65 27 21	2743	63 51 37	2731	62 15 38	2719
	SUN E.	107 46 54	2890	106 13 44	2848	104 40 19	2836	103 6 38	2826
24	Pollux W.	67 5 41	2482	68 47 19	2460	70 29 16	2457	72 11 31	2443
	Regulus W.	30 3 57	2487	31 45 29	2470	33 27 25	2453	35 9 44	2436
	Mars E.	54 11 56	2863	52 34 26	2861	50 56 40	2840	49 18 39	2829
	Antares E.	70 3 49	2488	68 21 9	2485	66 38 10	2412	64 54 53	2401
	SUN E.	95 14 20	2763	93 39 4	2751	92 3 32	2739	90 27 44	2726
25	Pollux W.	80 47 4	2364	82 31 1	2373	84 15 16	2360	85 59 48	2348
	Regulus W.	43 46 30	2368	45 30 51	2365	47 15 30	2343	49 0 27	2336
	Mars E.	41 4 49	2874	39 25 19	2864	37 45 35	2854	36 5 37	2845
	Antares E.	56 14 15	2343	54 29 18	2333	52 44 5	2320	50 58 35	2308
	SUN E.	82 24 36	2863	80 47 9	2862	79 9 25	2840	77 31 25	2829
26	Pollux W.	94 46 30	2294	96 32 37	2284	98 19 0	2274	100 5 38	2266
	Regulus W.	57 49 45	2270	59 36 28	2260	61 23 28	2248	63 10 44	2237
	Antares E.	42 7 10	2368	40 20 8	2347	38 32 51	2287	36 45 19	2226
	SUN E.	69 17 21	2569	67 37 44	2566	65 57 52	2548	64 17 45	2537
27	Regulus W.	72 10 51	2190	73 59 34	2181	75 48 30	2173	77 37 38	2165
	Spica W.	18 12 12	2229	19 59 56	2213	21 48 4	2198	23 36 34	2186
	Antares E.	27 44 28	2190	25 55 45	2184	24 6 53	2177	22 17 51	2173
	SUN E.	55 53 34	2488	54 12 4	2479	52 30 21	2470	50 48 26	2462
28	Regulus W.	86 46 0	2134	88 36 7	2129	90 26 22	2125	92 16 43	2120
	Spica W.	32 43 21	2138	34 33 22	2132	36 23 33	2126	38 13 53	2121
	SUN E.	42 16 15	2429	40 33 22	2424	38 50 21	2419	37 7 14	2414

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of D.M.	XV.	P. L. of D.M.	XVIII.	P. L. of D.M.	XXI.	P. L. of D.M.
19	Mars E.	110° 6' 53"	2000	108° 37' 17"	2022	107° 7' 31"	2013	105° 37' 34"	2003
20	α Arietis W.	95 45 49	2734	97 21 44	2725	96 57 50	2717	100 34 8	2707
	Aldebaran W.	63 0 31	2764	64 35 46	2754	63 11 14	2744	67 46 55	2735
	Saturn E.	41 49 41	2802	40 15 16	2790	38 40 47	2797	37 6 15	2797
	Jupiter E.	45 50 53	2798	44 16 16	2786	42 41 32	2782	41 6 41	2777
	Spica E.	70 48 1	2730	69 11 48	2712	67 35 24	2704	65 58 49	2696
	Mars E.	96 4 56	2806	96 33 50	2849	95 2 32	2839	93 31 2	2829
21	α Arietis W.	108 38 36	2683	110 16 5	2665	111 53 46	2644	113 31 41	2636
	Aldebaran W.	75 48 40	2684	77 25 41	2674	79 2 56	2663	80 40 25	2653
	Pollux W.	34 18 59	2779	35 53 55	2769	37 29 17	2741	39 5 3	2722
	Saturn E.	29 13 33	2806	27 39 13	2816	26 5 5	2827	24 31 12	2842
	Jupiter E.	33 11 4	2764	31 35 49	2763	30 0 33	2763	28 25 17	2764
	Spica E.	57 52 55	2649	56 15 7	2640	54 37 7	2632	52 58 56	2622
	Mars E.	85 50 30	2680	84 17 45	2670	82 44 48	2660	81 11 38	2650
22	Aldebaran W.	88 51 18	2601	90 30 11	2601	92 9 18	2601	93 48 39	2671
	Pollux W.	47 9 36	2643	48 47 32	2629	50 25 48	2613	52 4 25	2600
	Spica E.	44 44 37	2674	43 5 6	2664	41 25 21	2653	39 45 22	2644
	Mars E.	73 22 25	2706	71 47 52	2706	70 13 6	2776	68 38 6	2764
	Sun E.	113 57 6	2606	112 24 55	2604	110 52 29	2603	109 19 49	2672
23	Aldebaran W.	102 9 2	2616	103 49 50	2607	105 30 53	2497	107 12 11	2486
	Pollux W.	60 22 5	2623	62 2 32	2620	63 43 17	2607	65 24 20	2494
	Regulus W.	23 22 10	2664	25 1 54	2643	26 42 8	2623	28 22 49	2604
	Spica E.	31 22 16	2499	29 41 1	2489	27 59 33	2482	26 17 54	2473
	Mars E.	60 39 24	2706	59 2 55	2697	57 26 11	2686	55 49 11	2674
	Sun E.	101 32 42	2612	99 58 30	2601	96 24 3	2788	96 49 20	2776
24	Pollux W.	73 54 3	2482	75 36 52	2419	77 19 59	2406	79 3 23	2396
	Regulus W.	36 52 24	2494	38 35 25	2409	40 18 47	2396	42 2 29	2389
	Mars E.	47 40 23	2616	46 1 52	2607	44 23 6	2606	42 44 5	2606
	Antares E.	63 11 19	2689	61 27 28	2677	59 43 20	2666	57 58 56	2654
	Sun E.	88 51 39	2714	87 15 18	2701	85 38 40	2689	84 1 46	2678
25	Pollux W.	87 44 36	2396	89 29 40	2326	91 15 1	2316	93 0 37	2304
	Regulus W.	50 45 43	2317	52 31 17	2306	54 17 9	2294	56 3 18	2281
	Mars E.	34 25 27	2686	32 45 4	2686	31 4 30	2680	29 23 44	2611
	Antares E.	49 12 49	2299	47 26 48	2288	45 40 31	2277	43 53 58	2267
	Sun E.	75 53 9	2616	74 14 36	2604	72 35 47	2603	70 56 42	2601
26	Pollux W.	101 52 28	2267	103 39 31	2249	105 26 46	2240	107 14 14	2232
	Regulus W.	64 58 16	2287	66 46 3	2217	68 34 5	2206	70 22 21	2196
	Antares E.	34 57 33	2280	33 9 35	2211	31 21 24	2204	29 33 2	2196
	Sun E.	62 37 23	2606	60 56 46	2616	59 15 55	2607	57 34 51	2497
27	Regulus W.	79 26 58	2160	81 16 28	2151	83 6 9	2145	84 56 0	2130
	Spica W.	25 25 24	2173	27 14 32	2163	29 3 55	2154	30 53 32	2145
	Antares E.	20 28 42	2170	18 39 30	2170	16 50 18	2173	15 1 9	2178
	Sun E.	49 6 20	2455	47 24 3	2448	45 41 36	2441	43 59 0	2435
28	Regulus W.	94 7 11	2116	95 57 43	2116	97 48 19	2113	99 38 59	2111
	Spica W.	40 4 20	2119	41 54 52	2114	43 45 30	2110	45 36 14	2106
	Sun E.	35 24 1	2412	33 40 43	2409	31 57 21	2407	30 13 56	2405

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.						
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	16 32 15.21	13.984	20 28 45.7	33.11	21 49.0	1	19 17 51.73	13.378	22 11 30.3	17.92	22 32.4	
2	16 37 27.37	13.026	20 41 43.3	31.08	21 50.2	2	19 23 12.54	13.365	22 4 0.0	19.59	22 33.8	
3	16 42 40.47	13.066	20 54 6.3	30.22	21 51.5	3	19 28 32.78	13.350	21 55 49.8	21.26	22 35.2	
4	16 47 54.55	13.106	21 5 54.1	28.74	21 52.8	4	19 33 52.40	13.304	21 46 59.7	23.91	22 36.6	
5	16 53 9.57	13.144	21 17 6.0	27.24	21 54.1	5	19 39 11.36	13.274	21 37 30.3	24.84	22 38.0	
6	16 58 25.49	13.182	21 27 41.5	25.71	21 55.5	6	19 44 29.59	13.244	21 27 21.9	26.16	22 39.3	
7	17 3 42.29	13.218	21 37 40.1	24.18	21 56.8	7	19 49 47.07	13.212	21 16 34.9	27.76	22 40.7	
8	17 8 59.90	13.249	21 47 1.4	23.60	21 58.2	8	19 55 3.75	13.177	21 5 9.8	29.33	22 42.0	
9	17 14 18.28	13.280	21 55 44.9	21.02	21 59.5	9	20 0 19.57	13.141	20 53 7.1	30.89	22 43.3	
10	17 19 37.36	13.309	22 3 50.2	19.41	22 0.9	10	20 5 34.52	13.106	20 40 27.0	32.43	22 44.6	
11	17 24 57.10	13.336	22 11 16.8	17.79	22 2.3	11	20 10 48.56	13.065	20 27 10.2	33.94	22 45.9	
12	17 30 17.45	13.360	22 18 4.3	16.16	22 3.7	12	20 16 1.64	13.024	20 13 17.1	35.45	22 47.1	
13	17 35 38.40	13.384	22 24 12.3	14.80	22 5.1	13	20 21 13.74	12.983	19 58 48.3	36.93	22 48.4	
14	17 40 59.88	13.404	22 29 40.5	12.84	22 6.5	14	20 26 24.84	12.941	19 43 44.6	38.39	22 49.6	
15	17 46 21.81	13.421	22 34 28.7	11.17	22 7.9	15	20 31 34.90	12.898	19 28 6.3	39.80	22 50.8	
16	17 51 44.13	13.438	22 38 36.6	9.48	22 9.4	16	20 36 43.92	12.853	19 11 54.0	41.21	22 52.0	
17	17 57 6.81	13.452	22 42 3.8	7.78	22 10.8	17	20 41 51.86	12.808	18 55 8.3	42.59	22 53.2	
18	18 2 29.81	13.463	22 44 50.3	6.08	22 12.3	18	20 46 58.71	12.762	18 37 49.7	43.94	22 54.3	
19	18 7 53.04	13.473	22 46 55.7	4.37	22 13.8	19	20 52 4.46	12.716	18 19 59.0	45.37	22 55.5	
20	18 13 16.46	13.478	22 48 20.1	2.65	22 15.2	20	20 57 9.08	12.670	18 1 36.8	46.87	22 56.7	
21	18 18 40.00	13.483	22 49 3.2	-0.98	22 16.7	21	21 2 12.60	12.623	17 42 43.8	47.84	22 57.8	
22	18 24 3.60	13.488	22 49 5.0	+0.79	22 18.1	22	21 7 14.98	12.573	17 23 20.6	49.08	22 58.8	
23	18 29 27.23	13.484	22 48 25.2	2.51	22 19.5	23	21 12 16.21	12.528	17 3 27.7	50.30	22 59.9	
24	18 34 50.82	13.481	22 47 4.2	4.24	22 21.0	24	21 17 16.32	12.481	16 43 6.0	51.49	23 0.9	
25	18 40 14.33	13.476	22 45 1.7	5.96	22 22.5	25	21 22 15.32	12.435	16 22 16.0	52.66	23 01.9	
26	18 45 37.69	13.469	22 42 17.9	7.69	22 23.9	26	21 27 13.20	12.388	16 0 58.5	53.79	23 2.9	
27	18 51 0.85	13.460	22 38 52.6	9.41	22 25.4	27	21 32 9.97	12.342	15 39 14.0	54.90	23 3.8	
28	18 56 23.75	13.448	22 34 46.1	11.13	22 26.8	28	21 37 5.62	12.296	15 17 3.3	55.98	23 4.8	
29	19 1 46.35	13.433	22 29 58.3	12.84	22 28.2	29	21 42 0.16	12.250	14 54 27.3	57.03	23 5.7	
30	19 7 8.57	13.416	22 24 29.6	14.56	22 29.6	30	21 46 53.63	12.205	14 31 26.4	58.04	23 6.7	
31	19 12 30.38	13.399	22 18 20.2	16.24	22 31.1	31	21 51 46.03	12.162	14 8 1.4	59.03	23 7.5	
32	19 17 51.73	13.378	22 11 30.3	17.92	22 32.4	32	21 56 37.39	12.118	-13 44 13.1	59.98	23 8.4	
Day of Month, 1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month,	5th.	10th.	15th.	20th.	25th.
Semidiam. "	6.4	6.2	6.1	6.0	5.9	5.8	Semidiameter	5.6	5.6	5.5	5.4	5.4
Hor. Par. "	6.4	6.3	6.2	6.1	6.0	5.9	Horizontal Parallax	5.7	5.6	5.5	5.5	5.4

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m	
1	21 42 0.16	12-280	14 54 27.3	57-02	23 5.7
2	21 46 53.63	12-206	14 31 26.4	58-04	23 6.7
3	21 51 46.03	12-182	14 8 1.4	59-08	23 7.5
4	21 56 37.39	12-118	13 44 13.1	59-09	23 8.4
5	22 1 27.69	12-074	13 20 2.3	60-01	23 9.4
6	22 6 16.96	12-081	12 55 29.6	61-00	23 10.3
7	22 11 5.19	11-980	12 30 35.8	62-07	23 11.2
8	22 15 52.47	11-949	12 5 21.5	63-51	23 12.0
9	22 20 38.78	11-909	11 39 47.5	64-21	23 12.8
10	22 25 24.12	11-070	11 13 54.8	65-07	23 13.6
11	22 30 8.52	11-831	10 47 44.1	65-51	23 14.4
12	22 34 52.02	11-794	10 21 16.1	66-51	23 15.2
13	22 39 34.64	11-759	9 54 31.6	67-19	23 15.9
14	22 44 16.42	11-723	9 27 31.0	67-54	23 16.7
15	22 48 57.36	11-690	9 0 15.2	68-46	23 17.4
16	22 53 37.54	11-658	8 32 45.1	69-04	23 18.1
17	22 58 16.96	11-627	8 5 1.3	69-59	23 18.8
18	23 2 55.64	11-597	7 37 4.6	70-19	23 19.5
19	23 7 33.62	11-569	7 8 55.8	70-61	23 20.2
20	23 12 10.95	11-543	6 40 35.4	71-07	23 20.9
21	23 16 47.64	11-517	6 12 4.2	71-51	23 21.5
22	23 21 23.76	11-494	5 43 23.0	71-01	23 22.2
23	23 25 59.34	11-473	5 14 32.6	72-28	23 22.8
24	23 30 34.41	11-451	4 45 33.4	72-58	23 23.5
25	23 35 8.99	11-431	4 16 26.2	73-06	23 24.1
26	23 39 43.16	11-416	3 47 11.8	73-28	23 24.7
27	23 44 16.96	11-401	3 17 50.9	73-49	23 25.3
28	23 48 50.40	11-387	2 48 24.1	73-72	23 25.9
29	23 53 23.53	11-375	2 18 52.2	73-92	23 26.5
30	23 57 56.41	11-365	1 49 15.9	74-09	23 27.1
31	0 2 29.07	11-357	1 19 36.0	74-22	23 27.7
32	0 7 1.55	11-351	0 49 53.0	74-34	23 28.3

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	Noon.	
h m s	s	° ' "	"	h m	
1	0 7 1.55	11-351	0 49 53.0	74-34	23 28.3
2	0 11 33.90	11-346	0 20 7.5	74-43	23 28.9
3	0 16 6.15	11-342	0 9 39.5	74-47	23 29.5
4	0 20 38.34	11-342	0 39 27.1	74-48	23 30.0
5	0 25 10.55	11-342	1 9 14.8	74-48	23 30.6
6	0 29 42.76	11-342	1 39 2.2	74-48	23 31.2
7	0 34 15.02	11-345	2 8 48.5	74-48	23 31.8
8	0 38 47.37	11-351	2 38 32.4	74-47	23 32.4
9	0 43 19.89	11-360	3 8 13.5	74-44	23 33.0
10	0 47 52.62	11-368	3 37 51.1	74-38	23 33.6
11	0 52 25.56	11-377	4 7 24.7	73-79	23 34.2
12	0 56 58.74	11-389	4 36 53.4	73-56	23 34.9
13	1 1 32.21	11-403	5 6 16.3	73-28	23 35.5
14	1 6 6.03	11-417	5 35 32.7	73-03	23 36.2
15	1 10 40.24	11-434	6 4 41.9	72-73	23 36.8
16	1 15 14.85	11-451	6 33 43.4	72-38	23 37.4
17	1 19 49.92	11-471	7 2 36.4	72-02	23 38.1
18	1 24 25.48	11-493	7 31 20.2	71-62	23 38.8
19	1 29 1.57	11-514	7 59 54.0	71-19	23 39.5
20	1 33 38.22	11-540	8 28 17.2	70-73	23 40.2
21	1 38 15.47	11-568	8 56 28.8	70-28	23 40.9
22	1 42 53.38	11-596	9 24 28.3	69-71	23 41.5
23	1 47 31.95	11-623	9 52 15.1	69-17	23 42.2
24	1 52 11.23	11-659	10 19 48.4	68-56	23 42.9
25	1 56 51.27	11-694	10 47 7.3	67-97	23 43.7
26	2 1 32.11	11-718	11 14 11.1	67-38	23 44.4
27	2 6 13.76	11-753	11 40 59.3	66-06	23 45.2
28	2 10 56.24	11-790	12 7 31.1	65-07	23 46.0
29	2 15 39.62	11-827	12 33 45.7	65-23	23 46.8
30	2 20 23.94	11-864	12 59 42.3	64-47	23 47.6
31	2 25 9.17	11-904	13 25 20.3	63-68	23 48.4
32	2 29 55.32	11-944	+13 50 38.9	62-86	23 49.2

Day of the Month,	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	5.3	5.3	5.2	5.2	5.1	5.1
Hor. Parallax	5.4	5.3	5.3	5.2	5.2	5.1

Day of the Month,	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter	5.1	5.0	5.0	5.0	5.0	4.9
Hor. Parallax	5.1	5.1	5.0	5.0	5.0	5.0

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	2 25 9.17	11-004	+13 25 20.3	03-09	23 48.4	1	5 1 16.96	13-324	+22 59 37.6	24-51	0 21.5
2	2 29 55.32	11-944	13 50 38.9	02-55	23 49.2	2	5 6 34.98	13-266	23 9 6.0	23-84	0 22.9
3	2 34 42.48	11-987	14 15 37.3	02-06	23 50.1	3	5 11 53.68	13-204	23 17 54.0	21-16	0 24.3
4	2 39 30.68	12-029	14 40 14.9	01-11	23 51.0	4	5 17 17.07	13-221	23 26 1.6	19-47	0 25.7
5	2 44 19.88	12-071	15 4 30.7	00-19	23 51.9	5	5 22 33.08	13-246	23 33 23.4	17-75	0 27.1
6	2 49 10.10	12-116	15 28 24.1	00-24	23 52.8	6	5 27 53.64	13-266	23 40 13.9	16-08	0 28.5
7	2 54 01.45	12-162	15 51 54.3	00-26	23 53.7	7	5 33 14.69	13-286	23 46 17.8	14-29	0 29.8
8	2 58 53.86	12-207	16 15 00.6	07-25	23 54.6	8	5 38 36.19	13-404	23 51 40.0	13-54	0 31.2
9	3 3 47.40	12-253	16 37 42.4	06-21	23 55.6	9	5 43 58.08	13-417	23 56 20.1	10-79	0 32.6
10	3 8 42.03	12-299	16 59 58.9	05-14	23 56.6	10	5 49 20.30	13-431	24 0 18.0	9-02	0 34.1
11	3 13 37.75	12-345	17 21 49.1	04-08	23 57.6	11	5 54 42.79	13-441	24 3 33.4	7-25	0 35.5
12	3 18 34.58	12-391	17 43 12.4	03-09	23 58.6	12	6 0 5.49	13-460	24 6 6.1	5-47	0 36.9
13	3 23 32.52	12-437	18 4 8.1	01-73	23 59.7	13	6 5 26.34	13-434	24 7 55.8	3-08	0 38.4
14	3 28 31.57	12-484	18 24 35.6	00-54		14	6 10 51.28	13-436	24 9 2.8	1-09	0 39.8
15	3 33 31.76	12-531	18 44 34.2	00-23	0 0.7	15	6 16 14.24	13-456	24 9 26.9	+0-11	0 41.3
16	3 38 33.10	12-578	19 4 3.1	00-07	0 1.8	16	6 21 37.17	13-484	24 9 8.0	-1-08	0 42.7
17	3 43 35.54	12-624	19 23 1.5	00-78	0 2.9	17	6 26 59.99	13-447	24 8 6.1	3-47	0 44.2
18	3 48 39.08	12-670	19 41 28.7	00-47	0 4.1	18	6 32 22.64	13-439	24 6 21.2	5-27	0 45.6
19	3 53 43.72	12-716	19 59 24.3	00-14	0 5.3	19	6 37 45.07	13-429	24 3 53.3	7-03	0 47.0
20	3 58 49.46	12-762	20 16 47.6	00-78	0 6.4	20	6 43 7.25	13-418	24 0 42.8	8-58	0 48.4
21	4 3 56.29	12-808	20 33 37.9	01-40	0 7.5	21	6 48 29.12	13-408	23 56 49.7	10-00	0 49.8
22	4 9 4.17	12-850	20 49 54.4	02-07	0 8.7	22	6 53 50.59	13-384	23 52 13.8	12-38	0 51.3
23	4 14 13.10	12-898	21 5 36.7	02-53	0 9.9	23	6 59 11.58	13-364	23 46 55.5	14-14	0 52.7
24	4 19 23.05	12-936	21 20 44.1	07-06	0 11.2	24	7 4 32.07	13-343	23 40 55.1	16-09	0 54.1
25	4 24 34.03	12-978	21 35 15.8	02-56	0 12.4	25	7 9 52.02	13-319	23 34 12.9	17-03	0 55.5
26	4 29 46.00	13-019	21 49 11.2	04-05	0 13.7	26	7 15 11.39	13-293	23 26 48.9	18-36	0 56.8
27	4 34 58.94	13-069	22 2 30.2	03-52	0 14.0	27	7 20 30.08	13-269	23 18 43.5	21-08	0 58.2
28	4 40 12.81	13-097	22 15 12.4	00-06	0 16.2	28	7 25 48.06	13-233	23 9 57.0	23-79	0 59.5
29	4 45 27.58	13-133	22 27 16.6	00-27	0 17.5	29	7 31 5.27	13-201	23 0 29.7	24-47	1 0.8
30	4 50 43.21	13-169	22 38 42.4	07-77	0 18.8	30	7 36 21.71	13-167	22 50 22.1	26-15	1 2.1
31	4 55 59.69	13-208	22 49 29.6	06-16	0 20.2	31	7 41 37.32	13-123	22 39 34.5	27-30	1 3.5
32	5 1 16.96	13-225	+22 59 37.6	24-51	0 21.5	32	7 46 52.07	13-095	+22 28 7.5	29-44	1 4.9
Day of Month, 1st.						Day of the Month, 5th.					
Semidiam. 4.9						Semidiameter 5.0					
Hor. Par. 5.0						Hor. Parallax 5.0					

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	7 41 37.32	13-123	+22 39 34.5	27-80	1 3.5	1	10 15 24.94	11-646	+12 25 54.3	66-76	1 35.2
2	7 46 52.07	13-098	22 28 7.5	28-44	1 4.9	2	10 20 3.89	11-602	11 59 2.3	67-55	1 35.9
3	7 52 5.90	13-065	22 16 1.3	21-06	1 6.2	3	10 24 41.83	11-561	11 31 51.8	68-31	1 36.5
4	7 57 18.73	13-033	22 3 16.5	23-06	1 7.4	4	10 29 18.79	11-522	11 4 23.3	69-05	1 37.2
5	8 2 30.53	12-970	21 49 53.6	24-24	1 8.7	5	10 33 54.80	11-481	10 36 37.5	69-79	1 37.9
6	8 7 41.30	12-927	21 35 53.1	25-79	1 99.9	6	10 38 29.87	11-443	10 8 35.3	70-42	1 38.5
7	8 12 51.02	12-882	21 21 15.5	27-28	1 11.2	7	10 43 4.06	11-406	9 40 17.2	71-07	1 39.1
8	8 17 59.65	12-836	21 6 1.5	28-88	1 12.4	8	10 47 37.36	11-370	9 11 44.0	71-69	1 39.7
9	8 23 7.15	12-789	20 50 11.5	29-31	1 13.5	9	10 52 9.84	11-336	8 42 56.6	72-25	1 40.3
10	8 28 13.51	12-741	20 33 46.3	21-77	1 14.7	10	10 56 41.50	11-300	8 13 55.7	72-89	1 40.9
11	8 33 18.71	12-691	20 16 46.5	23-29	1 15.8	11	11 1 12.38	11-271	7 44 42.1	73-22	1 41.5
12	8 38 22.70	12-641	19 59 12.5	24-88	1 17.0	12	11 5 42.51	11-241	7 15 16.3	73-81	1 42.0
13	8 43 25.47	12-589	19 41 4.9	25-98	1 18.1	13	11 10 11.96	11-213	6 45 39.2	74-27	1 42.6
14	8 48 27.00	12-538	19 22 24.6	27-38	1 19.1	14	11 14 40.74	11-186	6 15 51.4	74-76	1 43.1
15	8 53 27.29	12-487	19 3 12.2	28-07	1 20.2	15	11 19 8.86	11-169	5 45 53.8	75-09	1 43.6
16	8 58 26.37	12-436	18 43 28.4	28-07	1 21.2	16	11 23 36.36	11-136	5 15 46.9	74-45	1 44.2
17	9 3 24.21	12-384	18 23 13.7	21-24	1 22.3	17	11 28 3.33	11-114	4 45 31.5	74-81	1 44.7
18	9 8 20.79	12-331	18 2 29.0	22-47	1 23.2	18	11 32 29.82	11-090	4 15 8.2	75-12	1 45.2
19	9 13 16.09	12-278	17 41 14.9	23-68	1 24.1	19	11 36 55.82	11-074	3 44 37.8	75-40	1 45.7
20	9 18 10.13	12-226	17 19 32.1	24-88	1 25.1	20	11 41 21.36	11-056	3 14 0.9	75-65	1 46.2
21	9 23 2.92	12-174	16 57 21.4	25-02	1 26.1	21	11 45 46.53	11-041	2 43 18.3	75-89	1 46.7
22	9 27 54.49	12-122	16 34 43.2	27-15	1 27.1	22	11 50 11.35	11-028	2 12 30.6	77-07	1 47.2
23	9 32 44.82	12-079	16 11 38.3	28-24	1 28.0	23	11 54 35.85	11-015	1 41 38.7	77-24	1 47.6
24	9 37 33.93	12-030	15 48 7.6	29-30	1 28.9	24	11 59 0.07	11-006	1 10 43.1	77-37	1 48.0
25	9 42 21.82	11-971	15 24 11.7	30-34	1 29.8	25	12 3 24.08	10-997	0 39 44.6	77-49	1 48.5
26	9 47 8.54	11-921	14 59 51.3	31-34	1 30.6	26	12 7 47.91	10-991	+ 0 8 43.7	77-57	1 49.0
27	9 51 54.08	11-873	14 35 7.3	32-32	1 31.4	27	12 12 11.63	10-986	- 0 22 19.1	77-62	1 49.4
28	9 56 39.47	11-826	14 10 0.0	33-27	1 32.2	28	12 16 35.25	10-984	0 53 22.8	77-65	1 49.9
29	10 1 21.72	11-780	13 44 30.2	34-19	1 32.9	29	12 20 58.83	10-982	1 24 26.6	77-64	1 50.2
30	10 6 3.87	11-734	13 18 38.9	35-07	1 33.7	30	12 25 22.38	10-982	1 55 29.8	77-62	1 50.7
31	10 10 44.94	11-689	12 52 26.7	35-92	1 34.4	31	12 29 45.95	10-986	2 26 32.0	77-56	1 51.2
32	10 15 24.94	11-645	+12 25 54.3	66-76	1 35.2	32	12 34 9.65	10-991	- 2 57 32.7	77-47	1 51.7
Day of the Month.						Day of the Month.					
5th.						4th.					
10th.						9th.					
15th.						14th.					
20th.						19th.					
25th.						24th.					
30th.						29th.					
Semidiameter						Semidiameter					
Hor. Parallax						Hor. Parallax					
5.2						5.5					
5.2						5.6					
5.3						5.7					
5.3						5.8					
5.4						5.9					
5.4						6.0					
5.5						6.1					
5.5											

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 34 9.65	10.991	2 57 32.7	77.47	1 51.7	1	14 49 42.76	11.807	17 13 56.0	80.73	2 9.0
2	12 38 33.50	10.996	3 28 30.7	77.34	1 52.2	2	14 54 26.65	11.831	17 38 1.1	80.69	2 9.8
3	12 42 57.47	11.003	3 59 25.2	77.20	1 52.7	3	14 59 11.62	11.866	18 1 41.1	80.62	2 10.6
4	12 47 21.64	11.013	4 30 15.7	77.01	1 53.1	4	15 3 57.67	11.941	18 24 55.4	80.54	2 11.4
5	12 51 46.07	11.026	5 1 1.7	76.80	1 53.5	5	15 8 44.80	11.997	18 47 43.2	80.42	2 12.2
6	12 56 10.76	11.038	5 31 42.3	76.56	1 54.0	6	15 13 33.04	12.033	19 10 3.5	80.29	2 13.1
7	13 0 35.76	11.049	6 2 16.6	76.29	1 54.5	7	15 18 22.39	12.078	19 31 55.6	80.07	2 14.0
8	13 5 1.15	11.066	6 32 44.0	76.09	1 55.0	8	15 23 12.81	12.123	19 53 19.0	80.00	2 14.9
9	13 9 26.92	11.083	7 3 3.9	75.66	1 55.5	9	15 28 4.30	12.168	20 14 12.9	80.01	2 15.8
10	13 13 53.12	11.101	7 33 15.4	75.29	1 55.9	10	15 32 56.87	12.212	20 34 36.5	80.34	2 16.7
11	13 18 19.78	11.121	8 3 17.7	74.89	1 56.4	11	15 37 50.50	12.256	20 54 29.2	80.04	2 17.7
12	13 22 46.94	11.143	8 33 10.5	74.49	1 56.9	12	15 42 45.16	12.299	21 13 50.3	80.70	2 18.7
13	13 27 14.64	11.166	9 2 52.9	74.03	1 57.4	13	15 47 40.85	12.341	21 32 39.0	80.34	2 19.7
14	13 31 42.91	11.191	9 32 23.9	73.54	1 57.9	14	15 52 37.54	12.383	21 50 54.8	80.06	2 20.7
15	13 36 11.79	11.216	10 1 42.9	73.06	1 58.5	15	15 57 35.24	12.424	22 8 36.9	80.54	2 21.7
16	13 40 41.30	11.244	10 30 49.3	72.49	1 59.1	16	16 2 33.90	12.463	22 25 44.9	80.10	2 22.8
17	13 45 11.49	11.273	10 59 42.4	71.92	1 59.7	17	16 7 33.48	12.502	22 42 17.9	80.64	2 23.8
18	13 49 42.39	11.303	11 28 21.4	71.31	2 0.3	18	16 12 34.00	12.540	22 58 15.5	80.15	2 24.9
19	13 54 14.03	11.334	11 56 45.6	70.70	2 0.8	19	16 17 35.42	12.575	23 13 37.0	80.63	2 25.9
20	13 58 46.45	11.366	12 24 54.2	70.02	2 1.4	20	16 22 37.66	12.609	23 28 22.0	80.09	2 27.0
21	14 3 19.69	11.402	12 52 46.5	69.33	2 2.0	21	16 27 40.66	12.642	23 42 29.7	80.53	2 28.1
22	14 7 53.75	11.437	13 20 21.9	68.61	2 2.6	22	16 32 44.46	12.675	23 55 59.6	80.04	2 29.2
23	14 12 28.67	11.474	13 47 39.6	67.86	2 3.2	23	16 37 49.06	12.707	24 8 51.2	80.34	2 30.3
24	14 17 45.52	11.513	14 14 38.8	67.07	2 3.9	24	16 42 54.39	12.734	24 21 4.3	80.78	2 31.4
25	14 21 41.29	11.552	14 41 18.9	66.26	2 4.6	25	16 48 0.34	12.760	24 32 38.3	80.00	2 32.6
26	14 26 19.02	11.592	15 7 39.1	65.41	2 5.3	26	16 53 6.87	12.784	24 43 32.5	80.42	2 33.8
27	14 30 57.71	11.633	15 33 38.6	64.53	2 6.0	27	16 58 13.98	12.804	24 53 46.6	80.74	2 35.0
28	14 35 37.42	11.676	15 59 16.8	63.63	2 6.7	28	17 3 21.60	12.827	25 3 20.2	80.06	2 36.2
29	14 40 18.15	11.719	16 24 32.9	62.70	2 7.4	29	17 8 29.66	12.844	25 12 13.1	80.34	2 37.4
30	14 44 59.93	11.763	16 49 26.3	61.73	2 8.2	30	17 13 38.10	12.858	25 20 24.6	80.61	2 38.6
31	14 49 42.76	11.807	17 13 56.0	60.72	2 9.0	31	17 18 46.85	12.870	25 27 54.5	80.80	2 39.8
32	14 54 26.65	11.851	17 38 1.1	59.69	2 9.8	32	17 23 55.84	12.878	25 34 42.8	80.14	2 41.0
Day of the Month, 3d. 8th. 13th. 18th. 23d. 28th.						Day of the Month, 3d. 8th. 13th. 18th. 23d. 28th.					
Semidiameter	6.2	6.3	6.5	6.6	6.8	Semidiameter	7.1	7.3	7.5	7.8	8.0
Hor. Parallax	6.2	6.4	6.5	6.7	6.8	Hor. Parallax	7.2	7.4	7.6	7.8	8.1

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.			Noon.	Noon.			Noon.		
	h	m	s	"	°	'	"	"	h	m
1	17	23	55.84	12.878	25	34	42.8	14.14	2	41.0
2	17	29	4.99	12.884	25	40	49.1	14.36	2	42.2
3	17	34	14.29	12.889	25	46	13.1	14.61	2	43.4
4	17	39	23.66	12.890	25	50	54.6	14.84	2	44.6
5	17	44	33.00	12.896	25	54	53.6	15.07	2	45.8
6	17	49	42.21	12.879	25	58	9.8	7.28	2	47.0
7	17	54	51.19	12.868	26	0	43.3	8.49	2	48.2
8	17	59	59.87	12.864	26	2	33.7	9.71	2	49.4
9	18	5	8.19	12.868	26	3	41.4	1.08	2	50.7
10	18	10	16.08	12.818	26	4	6.2	-0.15	2	51.9
11	18	15	23.44	12.794	26	3	48.5	+1.02	2	53.0
12	18	20	30.18	12.766	26	2	48.4	2.20	2	54.2
13	18	25	36.23	12.736	26	1	5.9	3.46	2	55.3
14	18	30	41.50	12.702	25	58	40.8	4.62	2	56.5
15	18	35	45.93	12.665	25	55	33.7	5.97	2	57.6
16	18	40	49.42	12.624	25	51	44.6	7.21	2	58.7
17	18	45	51.87	12.579	25	47	14.0	8.48	2	59.8
18	18	50	53.21	12.533	25	42	2.1	9.76	3	0.9
19	18	55	53.44	12.484	25	36	9.2	11.06	3	2.0
20	19	0	52.48	12.433	25	29	35.8	12.38	3	3.0
21	19	5	50.23	12.377	25	22	21.9	13.61	3	4.0
22	19	10	46.58	12.317	25	14	28.3	14.85	3	5.0
23	19	15	41.45	12.254	25	5	55.4	16.10	3	6.0
24	19	20	34.79	12.190	24	56	43.7	17.38	3	7.0
25	19	25	26.58	12.124	24	46	53.7	18.67	3	7.9
26	19	30	16.77	12.055	24	36	25.9	19.94	3	8.8
27	19	35	5.25	11.983	24	25	20.5	21.20	3	9.7
28	19	39	51.94	11.908	24	13	38.2	22.41	3	10.5
29	19	44	36.82	11.831	24	1	19.9	23.49	3	11.3
30	19	49	19.82	11.751	23	48	26.6	24.94	3	12.0
31	19	54	0.89	11.669	23	34	58.6	26.38	3	12.7
32	19	58	39.93	11.584	23	20	56.3	27.80	3	13.4

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.			Noon.	Noon.			Noon.		
	h	m	s	"	°	'	"	"	h	m
1	19	54	0.89	11.669	23	34	58.6	28.28	3	12.7
2	19	58	39.93	11.664	23	20	56.3	28.89	3	13.4
3	20	3	16.91	11.497	23	6	20.6	27.19	3	14.1
4	20	7	51.77	11.407	22	51	12.3	28.51	3	14.8
5	20	12	24.43	11.314	22	35	32.1	29.63	3	15.4
6	20	16	54.85	11.219	22	19	20.7	41.10	3	15.9
7	20	21	22.95	11.121	22	2	39.1	42.34	3	16.4
8	20	25	48.68	11.022	21	45	28.3	43.54	3	16.9
9	20	30	12.02	10.921	21	27	49.3	44.70	3	17.4
10	20	34	32.89	10.817	21	9	42.7	45.84	3	17.7
11	20	38	51.34	10.711	20	51	9.1	46.94	3	18.1
12	20	43	7.01	10.603	20	32	9.4	48.01	3	18.4
13	20	47	20.17	10.493	20	12	44.5	49.04	3	18.7
14	20	51	30.65	10.380	19	52	55.6	50.02	3	19.0
15	20	55	38.42	10.266	19	32	43.4	50.97	3	19.2
16	20	59	43.42	10.151	19	12	8.9	51.89	3	19.3
17	21	3	45.62	10.032	18	51	12.8	52.77	3	19.3
18	21	7	44.96	9.912	18	29	56.1	53.61	3	19.4
19	21	11	41.41	9.791	18	8	19.7	54.40	3	19.4
20	21	15	34.94	9.669	17	46	24.7	55.16	3	19.3
21	21	19	25.49	9.543	17	24	11.9	55.89	3	19.1
22	21	23	13.02	9.417	17	1	42.1	56.89	3	19.0
23	21	26	57.49	9.288	16	38	56.2	57.23	3	18.9
24	21	30	38.85	9.167	16	15	55.3	57.83	3	18.7
25	21	34	17.02	9.023	15	52	40.3	58.29	3	18.3
26	21	37	51.96	8.889	15	29	12.5	58.90	3	17.8
27	21	41	23.67	8.753	15	5	32.8	59.28	3	17.4
28	21	44	52.08	8.612	14	41	42.1	59.83	3	17.0
29	21	48	17.07	8.469	14	17	41.4	60.23	3	16.5
30	21	51	38.59	8.322	13	53	31.5	60.68	3	15.9
31	21	54	56.54	8.173	13	29	13.7	60.98	3	15.3
32	21	58	10.89	8.021	13	4	49.0	61.14	3	14.5

Day of the Month,	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	8.6	8.9	9.3	9.6	10.0	10.5
Hor. Parallax	8.6	9.0	9.3	9.7	10.1	10.6

Day of Month,	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiam.	11.0	11.6	12.1	12.8	13.6	14.4	15.4
Hor. Par.	11.1	11.6	12.2	12.9	13.7	14.5	15.5

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			h m s	s	° ' "	"	
1	23 52 10.30	6-189	1 13 12.0	48-84	5 7.3	1	1 9 36.24	6-328	7 38 45.4	41-11	4 23.6
2	23 54 38.71	6-190	0 55 41.4	48-83	5 5.9	2	1 13 8.16	6-328	7 55 10.1	40-04	4 21.2
3	23 57 7.21	6-189	0 38 10.6	48-80	5 4.4	3	1 14 49.25	6-341	8 11 30.5	48-78	4 19.8
4	23 59 35.78	6-191	0 20 40.0	48-78	5 2.9	4	1 17 19.53	6-349	8 27 46.6	48-08	4 18.3
5	0 2 4.40	6-194	0 3 9.6	48-76	5 1.4	5	1 19 45.00	6-357	8 43 58.4	48-40	4 17.0
6	0 4 33.09	6-197	0 14 30.3	48-73	4 59.9	6	1 23 17.66	6-368	9 9 5.7	48-31	4 15.6
7	0 7 1.87	6-201	0 31 49.6	48-70	4 58.5	7	1 24 50.53	6-374	9 16 8.3	48-01	4 14.2
8	0 9 30.74	6-206	0 49 18.1	48-66	4 57.1	8	1 27 23.60	6-382	9 32 6.2	38-51	4 12.8
9	0 11 50.70	6-209	1 6 45.6	48-63	4 55.7	9	1 29 56.88	6-391	9 47 50.2	38-30	4 11.5
10	0 14 28.75	6-212	1 24 12.1	48-57	4 54.2	10	1 32 30.36	6-399	10 3 47.2	38-30	4 10.1
11	0 16 57.89	6-216	1 41 37.3	48-52	4 52.7	11	1 35 4.05	6-408	10 19 30.1	38-18	4 8.7
12	0 19 27.14	6-220	1 59 1.2	48-46	4 51.3	12	1 37 37.96	6-417	10 35 7.7	38-30	4 7.3
13	0 21 56.49	6-225	2 16 23.6	48-39	4 49.8	13	1 40 12.08	6-426	10 50 39.9	38-78	4 6.0
14	0 24 25.94	6-230	2 33 44.3	48-33	4 48.4	14	1 42 46.42	6-436	11 6 6.7	38-30	4 4.6
15	0 26 55.51	6-234	2 51 3.2	48-26	4 46.9	15	1 45 21.00	6-446	11 21 27.9	38-38	4 3.2
16	0 29 25.19	6-239	3 8 20.2	48-16	4 45.5	16	1 47 55.80	6-454	11 36 43.4	38-02	4 1.8
17	0 31 54.98	6-244	3 25 35.2	48-06	4 44.1	17	1 50 30.82	6-464	11 51 53.0	37-78	4 0.5
18	0 34 24.89	6-248	3 42 48.0	48-00	4 42.6	18	1 53 6.06	6-473	12 6 56.7	37-02	3 59.1
19	0 36 54.91	6-253	3 59 58.5	48-00	4 41.2	19	1 55 41.53	6-483	12 21 54.2	37-25	3 57.8
20	0 39 25.04	6-258	4 17 6.6	48-78	4 39.7	20	1 58 17.22	6-492	12 36 45.4	37-00	3 56.4
21	0 41 55.27	6-262	4 34 12.0	48-07	4 38.3	21	2 0 53.12	6-500	12 51 30.2	36-72	3 55.1
22	0 44 25.62	6-267	4 51 14.7	48-55	4 36.9	22	2 3 29.24	6-509	13 6 8.5	36-45	3 53.8
23	0 46 56.08	6-273	5 8 14.6	48-43	4 35.4	23	2 6 5.59	6-519	13 20 40.2	36-10	3 52.4
24	0 49 26.66	6-277	5 25 11.6	48-31	4 34.0	24	2 8 42.16	6-529	13 35 5.2	35-00	3 51.1
25	0 51 57.36	6-282	5 42 5.5	48-18	4 32.6	25	2 11 18.97	6-539	13 49 23.4	34-51	3 49.8
26	0 54 28.19	6-287	5 58 56.1	48-04	4 31.1	26	2 13 56.03	6-548	14 3 34.7	34-32	3 48.5
27	0 56 59.15	6-293	6 15 43.4	41-00	4 29.7	27	2 16 33.33	6-559	14 17 39.0	34-08	3 47.1
28	0 59 30.25	6-299	6 32 27.2	41-78	4 28.3	28	2 19 10.88	6-570	14 31 36.2	34-72	3 45.8
29	1 2 1.50	6-305	6 49 7.4	41-00	4 26.9	29	2 21 48.68	6-580	14 45 26.1	34-43	3 44.5
30	1 4 32.91	6-312	7 5 43.0	41-44	4 25.5	30	2 24 26.74	6-591	14 59 8.8	34-12	3 43.2
31	1 7 4.49	6-319	7 22 16.6	41-28	4 24.0	31	2 27 5.06	6-603	15 12 44.1	33-38	3 41.9
32	1 9 36.24	6-326	+ 7 38 45.4	41-11	4 22.6	32	2 29 43.63	6-613	+15 26 11.9	33-30	3 40.6
Day of the Month,						Day of the Month,					
1st.						2d.					
9th.						10th.					
17th.						12th.					
25th.						24th.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
3.8						3.2					
6.5						5.4					
3.6						3.1					
6.1						5.2					
3.4						2.9					
5.8						5.0					
3.3						2.8					
5.6											

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	2 21 48.68	6.680	+14 45 26.1	34.43	3 44.5	1	3 45 30.82	6.919	+20 45 24.5	23.99	3 6.1
2	2 24 26.74	6.691	14 59 8.8	34.13	3 43.2	2	3 48 16.84	6.922	20 54 31.1	22.56	3 4.9
3	2 27 5.06	6.692	15 12 44.1	33.81	3 41.9	3	3 51 3.09	6.932	21 3 27.4	22.16	3 3.7
4	2 29 43.63	6.613	15 26 11.9	33.50	3 40.6	4	3 53 49.57	6.942	21 12 13.3	21.69	3 2.5
5	2 32 22.47	6.625	15 39 32.1	33.18	3 39.3	5	3 56 36.29	6.951	21 20 48.8	21.26	3 1.4
6	2 35 1.57	6.635	15 52 44.6	32.86	3 38.0	6	3 59 23.24	6.961	21 29 13.8	20.82	3 0.2
7	2 37 40.94	6.646	16 5 49.2	32.53	3 36.7	7	4 2 10.42	6.970	21 37 28.2	20.37	2 59.1
8	2 40 20.58	6.657	16 18 45.9	32.19	3 35.5	8	4 4 57.81	6.979	21 45 31.9	19.93	2 57.9
9	2 43 0.50	6.669	16 31 34.6	31.86	3 34.2	9	4 7 45.42	6.988	21 53 24.9	19.48	2 56.8
10	2 45 40.70	6.681	16 44 15.2	31.52	3 32.9	10	4 10 33.24	6.997	22 1 7.1	19.03	2 55.6
11	2 48 21.18	6.692	16 56 47.5	31.17	3 31.6	11	4 13 21.26	7.006	22 8 38.5	18.58	2 54.5
12	2 51 1.92	6.703	17 9 11.5	30.83	3 30.4	12	4 16 9.48	7.013	22 15 58.9	18.12	2 53.3
13	2 53 42.94	6.714	17 21 27.1	30.47	3 29.1	13	4 18 57.88	7.020	22 23 8.4	17.66	2 52.2
14	2 56 24.22	6.726	17 33 34.1	30.11	3 27.9	14	4 21 46.46	7.028	22 30 6.8	17.20	2 51.1
15	2 59 5.77	6.737	17 45 32.4	29.75	3 26.6	15	4 24 35.22	7.035	22 36 54.1	16.74	2 49.9
16	3 1 47.59	6.748	17 57 22.0	29.38	3 25.4	16	4 27 24.14	7.042	22 43 30.3	16.37	2 48.8
17	3 4 29.66	6.758	18 9 2.7	29.01	3 24.2	17	4 30 13.22	7.049	22 39 55.2	15.90	2 47.7
18	3 7 12.00	6.769	18 20 34.3	28.62	3 22.9	18	4 33 2.46	7.056	22 56 8.8	15.33	2 46.6
19	3 9 54.59	6.780	18 31 56.9	28.23	3 21.7	19	4 35 51.84	7.060	23 2 11.2	14.86	2 45.5
20	3 12 37.44	6.791	18 43 10.3	27.86	3 20.5	20	4 38 41.36	7.066	23 8 2.2	14.39	2 44.4
21	3 15 20.55	6.801	18 54 14.5	27.47	3 19.2	21	4 41 31.01	7.071	23 13 41.9	13.91	2 43.2
22	3 18 3.90	6.811	19 5 9.3	27.08	3 18.0	22	4 44 20.79	7.076	23 19 10.2	13.44	2 42.1
23	3 20 47.50	6.822	19 15 54.6	26.69	3 16.8	23	4 47 10.68	7.081	23 24 27.0	12.98	2 41.0
24	3 23 31.34	6.833	19 26 30.4	26.29	3 15.6	24	4 50 0.68	7.085	23 29 32.4	12.48	2 39.9
25	3 26 15.43	6.843	19 36 56.7	25.89	3 14.4	25	4 52 50.78	7.089	23 34 26.2	12.00	2 38.8
26	3 28 59.76	6.852	19 47 13.2	25.48	3 13.2	26	4 55 40.99	7.094	23 39 8.4	11.52	2 37.7
27	3 31 44.34	6.863	19 57 20.0	25.07	3 12.0	27	4 58 31.30	7.098	23 43 39.1	11.08	2 36.6
28	3 34 29.15	6.872	20 7 16.9	24.66	3 10.8	28	5 1 21.70	7.102	23 47 58.1	10.55	2 35.5
29	3 37 14.31	6.882	20 17 3.9	24.25	3 9.6	29	5 4 12.18	7.105	23 52 5.5	10.06	2 34.4
30	3 39 59.51	6.892	20 26 40.8	23.83	3 8.4	30	5 7 2.75	7.109	23 56 1.1	9.57	2 33.3
31	3 42 45.04	6.902	20 36 7.7	23.41	3 7.2	31	5 9 53.40	7.112	23 59 45.0	9.08	2 32.2
32	3 45 30.82	6.912	+20 45 24.5	22.99	3 6.1	32	5 12 44.13	7.115	+24 3 17.1	8.59	2 31.1
Day of the Month,						Day of the Month,					
		6th.	14th.	22d.	30th.			7th.	15th.	23d.	
Polar Semidiameter		2.7	2.6	2.5	2.5	Polar Semidiameter		2.4	2.4	2.3	
Horizontal Parallax		4.6	4.4	4.3	4.2	Horizontal Parallax		4.1	4.0	3.9	

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"			h m s	"	° ' "	"	
1	5 9 53.40	7-119	+23 59 45.0	0-08	2 32.2	1	6 37 57.72	7-009	+24 18 11.3	0-02	1 58.1
2	5 12 44.13	7-116	24 3 17.1	0-59	2 31.1	2	6 40 46.58	7-002	24 15 41.1	0-49	1 56.9
3	5 15 34.92	7-118	24 6 37.4	0-10	2 30.0	3	6 43 35.26	7-025	24 12 59.6	0-97	1 55.8
4	5 18 25.77	7-120	24 9 46.0	7-51	2 28.9	4	6 46 23.76	7-017	24 10 6.8	7-43	1 54.7
5	5 21 16.66	7-122	24 12 42.8	7-19	2 27.8	5	6 49 12.08	7-009	24 7 2.9	7-59	1 53.5
6	5 24 7.60	7-123	24 15 27.8	6-08	2 26.7	6	6 52 0.20	7-001	24 3 47.8	6-30	1 52.4
7	5 26 58.57	7-124	24 18 1.0	6-14	2 25.6	7	6 54 48.12	6-992	24 0 21.6	6-02	1 51.2
8	5 29 49.57	7-125	24 20 22.5	6-00	2 24.5	8	6 57 35.83	6-983	23 56 44.3	0-39	1 50.1
9	5 32 40.58	7-126	24 22 32.2	6-18	2 23.4	9	7 0 23.32	6-974	23 52 56.0	0-74	1 48.9
10	5 35 31.60	7-126	24 24 30.0	4-06	2 22.3	10	7 3 10.59	6-965	23 48 56.8	10-19	1 47.8
11	5 38 22.62	7-125	24 26 16.0	4-17	2 21.2	11	7 5 57.63	6-955	23 44 46.7	10-08	1 46.6
12	5 41 13.62	7-124	24 27 50.2	3-08	2 20.2	12	7 8 44.44	6-945	23 40 25.8	11-09	1 45.5
13	5 44 4.61	7-123	24 29 12.5	3-18	2 19.1	13	7 11 31.01	6-934	23 35 54.2	11-08	1 44.3
14	5 46 55.57	7-122	24 30 23.1	3-09	2 18.0	14	7 14 17.32	6-924	23 31 12.0	11-09	1 43.2
15	5 49 46.49	7-120	24 31 21.8	2-30	2 16.9	15	7 17 3.37	6-913	23 26 19.1	12-42	1 42.0
16	5 52 37.35	7-118	24 32 8.7	1-71	2 15.8	16	7 19 49.16	6-902	23 21 15.7	12-08	1 40.8
17	5 55 28.14	7-116	24 32 43.8	1-22	2 14.7	17	7 22 34.66	6-891	23 16 1.9	12-39	1 39.6
18	5 58 18.87	7-112	24 33 7.1	0-70	2 13.6	18	7 25 19.94	6-880	23 10 37.7	12-72	1 38.4
19	6 1 9.52	7-109	24 33 18.7	0-24	2 12.5	19	7 28 4.92	6-868	23 5 3.1	14-16	1 37.2
20	6 4 0.09	7-106	24 33 18.5	0-26	2 11.4	20	7 30 49.61	6-856	22 59 18.3	14-59	1 36.0
21	6 6 50.56	7-101	24 33 6.7	0-73	2 10.3	21	7 33 34.02	6-844	22 53 23.4	16-00	1 34.8
22	6 9 40.93	7-096	24 32 43.2	1-22	2 9.2	22	7 36 18.14	6-832	22 47 18.3	16-42	1 33.6
23	6 12 31.19	7-091	24 32 8.0	1-71	2 8.1	23	7 39 1.96	6-820	22 41 3.2	16-54	1 32.4
24	6 15 21.33	7-087	24 31 21.2	2-19	2 7.0	24	7 41 45.49	6-807	22 34 38.1	16-26	1 31.2
25	6 18 11.36	7-082	24 30 22.9	2-67	2 5.9	25	7 44 28.72	6-795	22 28 3.1	16-08	1 30.0
26	6 21 1.27	7-078	24 29 12.9	3-16	2 4.8	26	7 47 11.65	6-782	22 21 18.3	17-07	1 28.7
27	6 23 51.04	7-071	24 27 51.4	3-64	2 3.7	27	7 49 54.28	6-770	22 14 23.8	17-47	1 27.5
28	6 26 40.67	7-065	24 26 18.3	4-12	2 2.6	28	7 52 36.61	6-757	22 7 19.6	17-09	1 26.3
29	6 29 30.16	7-059	24 24 33.7	4-00	2 1.4	29	7 55 18.63	6-744	22 0 5.7	16-27	1 25.0
30	6 32 19.50	7-053	24 22 37.6	5-07	2 0.3	30	7 58 0.35	6-732	21 52 42.3	16-07	1 23.8
31	6 35 8.69	7-046	24 20 30.1	6-55	1 59.2	31	8 0 41.77	6-719	21 45 9.4	16-08	1 22.5
32	6 37 57.72	7-039	+24 18 11.3	6-02	1 58.1	32	8 3 22.89	6-707	+21 37 27.2	16-45	1 21.3
Day of the Month,						Day of the Month,					
1st.						3d.					
9th.						10th.					
17th.						11th.					
25th.						12th.					
Polar Semidiameter	2.3	2.2	2.1	2.1		Polar Semidiameter	2.1	2.0	2.0	2.0	
Horizontal Parallax	3.8	3.7	3.6	3.5		Horizontal Parallax	3.5	3.4	3.4	3.3	

GREENWICH MEAN TIME.

JULY.

AUGUST.

Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.						
	Noon.	Noon.		Noon.	Noon.				Noon.	Noon.		Noon.	Noon.								
	h	m	s	"	°	'	"	h	m	s	"	°	'	"	h	m					
1	8	0	41.77	6.719	+21	45	9.4	19.08	1	22.5	1	9	21	26.30	6.307	+16	41	10.5	29.36	0	41.1
2	8	8	22.89	6.707	21	37	27.2	19.45	1	21.3	2	9	23	57.51	6.294	16	29	22.5	29.64	0	39.7
3	8	6	3.70	6.694	21	29	35.7	19.84	1	20.0	3	9	26	28.42	6.282	16	17	27.9	29.90	0	38.3
4	8	8	44.20	6.681	21	21	34.9	20.22	1	18.7	4	9	28	59.04	6.270	16	5	27.0	30.17	0	36.8
5	8	11	24.38	6.667	21	13	25.0	20.60	1	17.5	5	9	31	29.38	6.256	15	53	19.8	30.43	0	35.4
6	8	14	4.24	6.654	21	5	6.1	20.97	1	16.2	6	9	33	59.44	6.246	15	41	6.4	30.68	0	33.9
7	8	16	43.79	6.641	20	56	38.3	21.34	1	14.9	7	9	36	29.21	6.234	15	28	46.9	30.92	0	32.5
8	8	19	23.02	6.628	20	48	1.7	21.71	1	13.6	8	9	38	58.70	6.222	15	16	21.5	31.18	0	31.0
9	8	22	1.94	6.616	20	39	16.3	22.07	1	12.3	9	9	41	27.90	6.211	15	3	50.2	31.43	0	29.6
10	8	24	40.52	6.601	20	30	22.3	22.43	1	11.0	10	9	43	56.83	6.199	14	51	13.1	31.68	0	28.1
11	8	27	18.77	6.587	20	21	19.7	22.78	1	9.7	11	9	46	25.49	6.186	14	38	30.4	31.89	0	26.6
12	8	29	56.68	6.573	20	12	8.7	23.13	1	8.4	12	9	48	53.87	6.177	14	26	42.1	32.13	0	25.2
13	8	33	34.26	6.559	20	2	49.3	23.48	1	7.1	13	9	51	21.98	6.165	14	12	48.3	32.38	0	23.7
14	8	35	11.51	6.545	19	53	21.6	23.82	1	5.8	14	9	53	49.82	6.154	13	59	49.1	32.57	0	22.2
15	8	37	48.43	6.531	19	43	45.8	24.16	1	4.5	15	9	56	17.38	6.143	13	46	44.7	32.79	0	20.8
16	8	40	25.02	6.517	19	34	1.8	24.50	1	3.1	16	9	58	44.67	6.132	13	33	35.0	33.01	0	19.3
17	8	43	1.27	6.503	19	24	9.8	24.83	1	1.8	17	10	1	11.71	6.123	13	20	20.2	33.22	0	17.8
18	8	45	37.19	6.489	19	14	10.0	25.15	1	0.5	18	10	3	38.51	6.112	13	7	0.4	33.43	0	16.3
19	8	48	12.77	6.476	19	4	2.3	25.47	0	59.1	19	10	6	5.07	6.102	12	53	35.6	33.63	0	14.8
20	8	50	48.02	6.463	18	53	46.9	25.80	0	57.7	20	10	8	31.40	6.092	12	40	6.0	33.83	0	13.3
21	8	53	22.95	6.448	18	43	23.9	26.12	0	56.4	21	10	10	57.50	6.083	12	26	31.6	34.03	0	11.8
22	8	56	57.55	6.434	18	32	53.3	26.43	0	55.0	22	10	13	23.37	6.073	12	12	52.5	34.23	0	10.3
23	8	58	31.82	6.421	18	22	15.2	26.74	0	53.7	23	10	15	49.02	6.064	11	59	8.7	34.42	0	8.8
24	9	1	5.77	6.406	18	11	29.7	27.05	0	52.3	24	10	18	14.46	6.056	11	45	20.4	34.61	0	7.2
25	9	3	39.40	6.395	18	0	37.0	27.35	0	50.9	25	10	20	39.70	6.047	11	31	27.6	34.79	0	5.7
26	9	6	12.72	6.382	17	49	37.1	27.65	0	49.5	26	10	23	4.74	6.039	11	17	30.5	34.97	0	4.2
27	9	8	45.74	6.369	17	38	30.0	27.93	0	48.1	27	10	25	29.59	6.031	11	3	29.1	35.18	0	2.7
28	9	11	18.46	6.357	17	27	15.8	28.23	0	46.7	28	10	27	54.25	6.023	10	49	23.5	35.32	0	1.1
29	9	13	50.87	6.344	17	15	54.7	28.52	0	45.3	29	10	30	18.71	6.015	10	35	13.8	35.49	23	58.1
30	9	16	22.96	6.332	17	4	26.7	28.81	0	43.9	30	10	32	42.98	6.007	10	21	0.1	35.64	23	56.5
31	9	18	54.79	6.319	16	52	51.9	29.09	0	42.5	31	10	35	7.07	6.000	10	6	42.5	35.81	23	55.0
32	9	21	26.30	6.307	+16	41	10.5	29.36	0	41.1	32	10	37	30.98	6.993	+ 9	52	21.1	35.97	23	53.4
Day of the Month,		4th.	13th.	20th.	28th.	Day of the Month,		5th.	13th.	21st.	29th.										
Polar Semidiameter		2.0	2.0	2.0	1.9	Polar Semidiameter		1.9	1.9	1.9	1.9										
Horizontal Parallax		3.3	3.3	3.3	3.2	Horizontal Parallax		3.2	3.2	3.2	3.2										

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
2	10 37 30.96	5-998	+ 9 52 21.1	38-97	23 53.4	1	11 48 34.35	5-888	+ 2 19 59.2	38-87	23 6.1
3	10 39 54.72	5-996	9 37 55.9	38-12	23 51.9	2	11 50 55.68	5-889	2 4 25.8	38-91	23 4.5
4	10 42 18.31	5-990	9 23 27.2	38-27	23 50.3	3	11 53 17.02	5-889	1 48 51.5	38-94	23 2.9
5	10 44 41.75	5-974	9 8 55.0	38-41	23 48.8	4	11 55 38.38	5-890	1 33 16.4	38-98	23 1.3
6	10 47 5.05	5-968	8 54 19.4	38-55	23 47.2	5	11 57 59.76	5-891	1 17 40.6	38-00	23 59.8
7	10 49 28.20	5-962	8 39 40.6	38-68	23 45.7	6	12 0 21.17	5-892	1 2 4.2	38-03	23 58.2
8	10 51 51.21	5-956	8 24 58.5	38-83	23 44.1	7	12 2 42.62	5-894	0 46 27.4	38-06	23 56.6
9	10 54 14.08	5-950	8 10 13.3	38-96	23 42.5	8	12 5 4.11	5-896	0 30 50.3	38-08	23 55.0
10	10 56 36.80	5-944	7 55 25.0	37-07	23 41.0	9	12 7 25.64	5-899	+ 0 15 12.9	38-00	23 53.4
11	10 58 59.39	5-938	7 40 33.8	37-19	23 39.4	10	12 9 47.22	5-900	- 0 0 24.7	38-07	23 51.8
12	11 1 21.85	5-932	7 25 39.8	37-31	23 37.8	11	12 12 8.84	5-902	0 16 2.3	38-08	23 50.3
13	11 3 44.19	5-927	7 10 43.1	37-43	23 36.3	12	12 14 30.53	5-905	0 31 39.8	38-06	23 48.7
14	11 6 6.41	5-923	6 55 43.7	37-53	23 34.7	13	12 16 52.29	5-908	0 47 17.3	38-06	23 47.1
15	11 8 28.51	5-919	6 40 41.8	37-63	23 33.1	14	12 19 14.14	5-912	1 2 54.5	38-04	23 45.5
16	11 10 50.51	5-914	6 25 37.4	37-73	23 31.5	15	12 21 36.07	5-916	1 18 31.5	38-00	23 44.0
17	11 13 12.40	5-910	6 10 30.6	37-83	23 29.9	16	12 23 58.09	5-920	1 34 8.1	38-01	23 42.4
18	11 15 34.20	5-906	5 55 21.5	37-92	23 28.4	17	12 26 20.21	5-924	1 49 44.2	38-00	23 40.8
19	11 17 55.92	5-903	5 40 10.2	38-02	23 26.8	18	12 28 42.44	5-928	2 5 19.8	38-07	23 39.3
20	11 20 17.57	5-901	5 24 56.8	38-10	23 25.2	19	12 31 4.78	5-933	2 20 54.8	38-04	23 37.7
21	11 22 39.17	5-899	5 9 41.4	38-18	23 23.6	20	12 33 27.24	5-938	2 36 29.1	38-01	23 36.1
22	11 25 0.72	5-897	4 54 24.0	38-27	23 22.0	21	12 35 49.83	5-944	2 52 2.6	38-00	23 34.5
23	11 27 22.21	5-894	4 39 4.6	38-35	23 20.4	22	12 38 12.55	5-950	3 7 35.2	38-04	23 33.0
24	11 29 43.65	5-892	4 23 43.4	38-43	23 18.8	23	12 40 35.42	5-956	3 23 6.9	38-00	23 31.4
25	11 32 5.05	5-891	4 8 20.4	38-49	23 17.3	24	12 42 58.43	5-962	3 38 37.5	38-05	23 29.8
26	11 34 26.42	5-890	3 52 55.8	38-56	23 15.7	25	12 45 21.61	5-969	3 54 6.9	38-00	23 28.3
27	11 36 47.77	5-889	3 37 29.7	38-63	23 14.1	26	12 47 44.95	5-976	4 9 35.0	38-04	23 26.7
28	11 39 9.10	5-889	3 22 2.1	38-68	23 12.5	27	12 50 8.47	5-983	4 25 1.7	38-08	23 25.2
29	11 41 30.41	5-888	3 6 33.2	38-73	23 10.9	28	12 52 32.16	5-990	4 40 26.9	38-02	23 23.7
30	11 43 51.72	5-888	2 51 3.0	38-78	23 9.3	29	12 55 56.03	5-998	4 55 50.5	38-04	23 22.1
31	11 46 13.03	5-888	2 35 31.6	38-83	23 7.7	30	12 57 20.09	6-006	5 11 12.4	38-00	23 20.6
32	11 48 34.35	5-888	2 19 59.2	38-87	23 6.1	31	12 59 44.33	6-014	5 26 32.5	38-00	23 19.1
33	11 50 55.68	5-889	+ 2 4 25.8	38-91	23 4.5	32	13 2 8.77	6-022	- 5 41 50.7	38-01	23 17.5
Day of the Month,						Day of the Month,					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
6th.						8th.					
14th.						16th.					
22d.						24th.					
30th.											
1.9						2.0					
3.2						3.3					

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	h	m	s		°	'	"				h	m	h		m	s	°			'	"	h	m
1	13	2	8.77	6-022	5	41	50.7	28-21	22 17.5	1	14	16	18.67	6-373	12	57	18.3	22-70	21 33.5
2	13	4	33.40	6-030	5	57	6.8	28-12	22 15.9	2	14	18	51.81	6-386	13	10	44.5	22-48	21 32.1
3	13	6	58.24	6-039	6	12	20.7	28-08	22 14.4	3	14	21	25.29	6-402	13	24	5.3	22-26	21 30.8
4	13	9	23.29	6-048	6	27	32.4	27-54	22 12.9	4	14	23	59.12	6-417	13	37	20.5	22-02	21 29.3
5	13	11	48.55	6-057	6	42	41.7	27-44	22 11.4	5	14	26	33.31	6-432	13	50	30.1	22-78	21 28.0
6	13	14	14.04	6-066	6	57	48.6	27-39	22 9.9	6	14	29	7.86	6-447	14	3	34.0	22-54	21 26.6
7	13	16	39.74	6-076	7	12	52.9	27-32	22 8.4	7	14	31	42.77	6-462	14	16	32.0	22-29	21 25.3
8	13	19	5.66	6-086	7	27	54.5	27-21	22 6.9	8	14	34	18.05	6-477	14	29	24.0	22-04	21 23.9
9	13	21	31.82	6-095	7	42	53.3	27-39	22 5.4	9	14	36	53.69	6-492	14	42	10.0	21-79	21 22.6
10	13	23	58.21	6-106	7	57	49.3	27-27	22 3.9	10	14	39	29.70	6-508	14	54	49.8	21-58	21 21.2
11	13	26	24.85	6-115	8	12	42.3	27-14	22 2.4	11	14	42	6.09	6-524	15	7	23.3	21-26	21 19.9
12	13	28	51.75	6-126	8	27	32.2	27-01	22 0.9	12	14	44	42.85	6-540	15	19	50.4	20-99	21 18.6
13	13	31	18.91	6-137	8	42	18.9	26-58	21 59.4	13	14	47	20.00	6-556	15	32	11.0	20-72	21 17.2
14	13	33	46.33	6-148	8	57	2.3	26-74	21 57.9	14	14	49	57.54	6-572	15	44	25.0	20-44	21 15.9
15	13	36	14.02	6-159	9	11	42.3	26-60	21 56.4	15	14	52	35.46	6-588	15	56	32.2	20-16	21 14.6
16	13	38	41.99	6-170	9	26	18.9	26-48	21 54.9	16	14	55	13.78	6-605	16	8	32.5	20-87	21 13.4
17	13	41	10.23	6-182	9	40	51.9	26-30	21 53.5	17	14	57	52.50	6-622	16	20	25.9	20-58	21 12.1
18	13	43	38.75	6-194	9	55	21.2	26-14	21 52.0	18	15	0	31.62	6-638	16	32	12.2	20-28	21 10.8
19	13	46	7.56	6-207	10	9	46.8	26-08	21 50.6	19	15	3	11.14	6-654	16	43	51.3	20-08	21 9.5
20	13	48	36.68	6-220	10	24	8.5	26-02	21 49.1	20	15	5	51.07	6-671	16	55	23.1	20-67	21 8.2
21	13	51	6.12	6-233	10	38	26.2	26-55	21 47.6	21	15	8	31.41	6-689	17	6	47.6	20-36	21 7.0
22	13	53	35.88	6-247	10	52	39.8	26-48	21 46.2	22	15	11	12.16	6-707	17	18	4.6	20-05	21 5.7
23	13	56	5.96	6-261	11	6	49.2	26-30	21 44.8	23	15	13	53.33	6-724	17	29	14.1	27-73	21 4.4
24	13	58	36.38	6-274	11	20	54.2	26-12	21 43.3	24	15	16	34.01	6-741	17	40	15.8	27-40	21 3.2
25	14	1	7.12	6-288	11	34	54.8	26-02	21 41.9	25	15	19	16.90	6-758	17	51	9.6	27-07	21 2.0
26	14	3	38.20	6-302	11	48	50.9	26-74	21 40.5	26	15	21	59.30	6-776	18	1	55.4	26-74	21 0.7
27	14	6	9.61	6-316	12	2	42.2	26-54	21 39.1	27	15	24	42.11	6-792	18	12	33.1	26-40	20 59.5
28	14	8	41.35	6-330	12	16	28.7	26-33	21 37.7	28	15	27	25.32	6-809	18	23	2.5	26-03	20 58.3
29	14	11	13.45	6-344	12	30	10.3	26-12	21 36.3	29	15	30	8.94	6-826	18	33	23.5	25-70	20 57.1
30	14	13	45.88	6-359	12	43	46.9	26-02	21 34.9	30	15	32	52.96	6-842	18	43	36.0	25-24	20 55.9
31	14	16	18.67	6-373	12	57	18.3	25-70	21 33.5	31	15	35	37.38	6-859	18	53	40.0	24-98	20 54.7
32	14	18	51.81	6-388	13	10	44.5	25-48	21 32.1	32	15	38	22.20	6-875	19	3	35.3	24-62	20 53.5
Day of the Month,				1st.	9th.				17th.	25th.	Day of the Month,				3d.	11th.	19th.	27th.	
Polar Semidiameter				2.0	2.0				2.1	2.1	Polar Semidiameter				2.1	2.2	2.3	2.3	
Horizontal Parallax				3.4	3.4				3.5	3.6	Horizontal Parallax				3.6	3.7	3.8	3.9	

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>h m</i>
1	9 55 54.31	0.593	+13 38 43.8	3.77	15 8.9	1	9 43 51.48	1.344	+14 47 43.4	6.68	12 54.8
2	9 55 39.59	0.624	13 40 17.1	3.68	15 4.6	2	9 43 21.50	1.363	14 50 24.1	6.71	12 50.4
3	9 55 24.27	0.663	13 41 53.3	4.06	15 0.4	3	9 42 51.32	1.361	14 53 5.3	6.73	12 45.9
4	9 55 8.26	0.681	13 43 32.9	4.23	14 56.2	4	9 42 20.95	1.360	14 55 46.9	6.73	12 41.5
5	9 54 51.57	0.700	13 45 15.9	4.36	14 52.0	5	9 41 51.41	1.376	14 58 23.7	6.74	12 37.1
6	9 54 34.22	0.736	13 47 2.3	4.50	14 47.8	6	9 41 19.73	1.380	15 1 10.7	6.76	12 32.6
7	9 54 16.20	0.764	13 48 51.9	4.63	14 43.5	7	9 40 48.93	1.385	15 3 52.6	6.75	12 28.1
8	9 53 57.53	0.791	13 50 44.7	4.76	14 39.2	8	9 40 18.04	1.386	15 6 34.5	6.74	12 23.7
9	9 53 38.22	0.817	13 52 40.6	4.89	14 35.0	9	9 39 47.07	1.391	15 9 16.1	6.73	12 19.3
10	9 53 18.28	0.843	13 54 39.5	5.01	14 30.8	10	9 39 16.06	1.392	15 11 57.3	6.71	12 14.8
11	9 52 57.73	0.869	13 56 41.4	5.13	14 26.5	11	9 38 45.02	1.393	15 14 38.0	6.68	12 10.3
12	9 52 36.57	0.894	13 58 46.1	5.25	14 22.2	12	9 38 13.98	1.393	15 17 18.0	6.64	12 5.9
13	9 52 14.52	0.918	14 0 53.6	5.37	14 17.9	13	9 37 42.97	1.391	15 19 57.2	6.63	12 1.4
14	9 51 52.50	0.941	14 3 3.8	5.48	14 13.6	14	9 37 12.00	1.388	15 22 35.5	6.58	11 56.9
15	9 51 29.62	0.964	14 5 16.5	5.58	14 9.3	15	9 36 41.10	1.385	15 25 12.9	6.54	11 52.5
16	9 51 6.20	0.987	14 7 31.7	5.68	14 5.0	16	9 36 10.29	1.381	15 27 49.2	6.49	11 48.0
17	9 50 42.24	1.009	14 9 49.2	5.78	14 0.7	17	9 35 39.61	1.376	15 30 24.3	6.43	11 43.6
18	9 50 17.77	1.030	14 12 9.0	5.87	13 56.3	18	9 35 9.07	1.369	15 32 58.1	6.37	11 39.3
19	9 49 52.81	1.050	14 14 31.0	5.96	13 52.0	19	9 34 38.70	1.361	15 35 30.5	6.31	11 34.8
20	9 49 27.38	1.069	14 16 55.0	6.04	13 47.6	20	9 34 8.51	1.353	15 38 1.4	6.26	11 30.3
21	9 49 1.49	1.088	14 19 20.9	6.12	13 43.2	21	9 33 38.53	1.344	15 40 30.7	6.18	11 25.9
22	9 48 35.15	1.106	14 21 48.7	6.19	13 38.8	22	9 33 8.78	1.334	15 42 58.3	6.11	11 21.5
23	9 48 8.39	1.123	14 24 18.2	6.26	13 34.5	23	9 32 39.27	1.323	15 45 24.1	6.03	11 17.1
24	9 47 41.22	1.140	14 26 49.3	6.33	13 30.1	24	9 32 10.03	1.312	15 47 48.0	5.95	11 12.7
25	9 47 13.66	1.156	14 29 21.9	6.39	13 25.7	25	9 31 41.08	1.300	15 50 9.9	5.87	11 8.3
26	9 46 45.74	1.171	14 31 55.9	6.44	13 21.3	26	9 31 12.44	1.286	15 52 29.8	5.79	11 3.9
27	9 46 17.46	1.185	14 34 31.3	6.49	13 16.9	27	9 30 44.13	1.272	15 54 47.5	5.69	10 59.5
28	9 45 48.85	1.199	14 37 7.8	6.54	13 12.5	28	9 30 16.16	1.257	15 57 3.0	5.60	10 55.1
29	9 45 19.93	1.211	14 39 45.4	6.58	13 8.1	29	9 29 48.56	1.243	15 59 16.2	5.50	10 50.7
30	9 44 50.71	1.223	14 42 23.9	6.62	13 3.6	30	9 29 21.34	1.228	16 1 27.0	5.40	10 46.3
31	9 44 21.22	1.234	14 45 3.3	6.65	12 59.2	31	9 28 54.53	1.208	16 3 35.4	5.30	10 42.0
32	9 43 51.48	1.244	+14 47 43.4	6.68	12 54.8	32	9 28 28.14	1.090	+16 5 41.2	6.19	10 37.6
Day of the Month,		1st.	11th.	21st.	31st.	Day of the Month,		1st.	11th.	21st.	31st.
Polar Semidiameter		20.1	20.6	21.0	21.2	Polar Semidiameter		21.2	21.3	21.2	21.0
Horizontal Parallax		1.9	1.9	1.9	2.0	Horizontal Parallax		2.0	2.0	2.0	1.9

GREENWICH MEAN TIME.

MARCH.

APRIL.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	s	°	'	"	s	h		m	h	m	s	s	°	'	"	s	h	m
1	9	29	48.56	1.142	+15	59	16.2	8.40	10	50.7	1	9	30	1.30	0.362	+16	43	38.7	1.42	8	39.3
2	9	29	21.34	1.136	16	1	27.0	8.40	10	46.3	2	9	19	52.98	0.331	16	44	11.0	1.27	8	35.3
3	9	28	54.53	1.108	16	3	35.4	8.30	10	42.0	3	9	19	45.40	0.300	16	44	39.9	1.12	8	31.2
4	9	28	28.14	1.080	16	5	41.2	8.19	10	37.6	4	9	19	38.56	0.269	16	45	5.2	0.98	8	27.2
5	9	28	2.19	1.072	16	7	44.5	8.08	10	33.3	5	9	19	32.46	0.238	16	45	26.9	0.83	8	23.2
6	9	27	36.69	1.052	16	9	45.1	7.96	10	28.9	6	9	19	27.11	0.207	16	45	45.1	0.68	8	19.1
7	9	27	11.67	1.022	16	11	42.9	7.85	10	24.6	7	9	19	22.51	0.176	16	45	59.8	0.54	8	15.1
8	9	26	47.15	1.011	16	13	38.0	7.72	10	20.2	8	9	19	18.66	0.145	16	46	11.0	0.39	8	11.1
9	9	26	23.13	0.989	16	15	30.2	7.61	10	15.9	9	9	19	15.56	0.112	16	46	18.6	0.24	8	7.1
10	9	25	59.64	0.967	16	17	19.4	7.48	10	11.6	10	9	19	13.21	0.082	16	46	22.7	+0.10	8	3.1
11	9	25	36.69	0.944	16	19	5.6	7.36	10	7.3	11	9	19	11.61	0.051	16	46	23.3	-0.05	7	59.2
12	9	25	14.30	0.921	16	20	48.8	7.22	10	3.0	12	9	19	10.76	-0.020	16	46	20.3	0.20	7	55.2
13	9	24	52.48	0.897	16	22	28.9	7.10	9	58.7	13	9	19	10.66	+0.012	16	46	13.8	0.24	7	51.3
14	9	24	31.25	0.872	16	24	5.9	6.97	9	54.4	14	9	19	11.32	0.043	16	46	3.8	0.49	7	47.3
15	9	24	10.63	0.846	16	25	39.6	6.83	9	50.2	15	9	19	12.72	0.074	16	45	50.3	0.63	7	43.4
16	9	23	50.62	0.820	16	27	10.1	6.70	9	45.9	16	9	19	14.86	0.105	16	45	33.4	0.78	7	39.5
17	9	23	31.23	0.794	16	28	37.4	6.57	9	41.7	17	9	19	17.75	0.135	16	45	13.1	0.92	7	35.6
18	9	23	12.48	0.767	16	30	1.3	6.43	9	37.4	18	9	19	21.38	0.166	16	44	49.3	1.06	7	31.7
19	9	22	54.38	0.740	16	31	21.9	6.30	9	33.2	19	9	19	25.74	0.196	16	44	22.1	1.20	7	27.9
20	9	22	36.93	0.712	16	32	39.2	6.18	9	29.0	20	9	19	30.83	0.227	16	43	51.5	1.34	7	24.1
21	9	22	20.15	0.685	16	33	53.1	6.06	9	24.8	21	9	19	36.64	0.257	16	43	17.5	1.48	7	20.3
22	9	22	4.04	0.657	16	35	3.6	5.92	9	20.6	22	9	19	43.18	0.287	16	42	40.2	1.62	7	16.5
23	9	21	48.61	0.628	16	36	10.6	5.78	9	16.4	23	9	19	50.44	0.317	16	41	59.6	1.76	7	12.7
24	9	21	33.86	0.599	16	37	14.2	5.65	9	12.2	24	9	19	58.40	0.346	16	41	15.7	1.90	7	8.9
25	9	21	19.81	0.570	16	38	14.4	5.52	9	8.0	25	9	20	7.07	0.376	16	40	28.6	2.03	7	5.1
26	9	21	6.46	0.541	16	39	11.1	5.39	9	3.9	26	9	20	16.45	0.405	16	39	38.2	2.16	7	1.3
27	9	20	53.81	0.512	16	40	4.4	5.25	8	59.8	27	9	20	26.52	0.434	16	38	44.5	2.30	6	57.5
28	9	20	41.87	0.482	16	40	54.3	5.10	8	55.7	28	9	20	37.29	0.462	16	37	47.7	2.43	6	53.8
29	9	20	30.65	0.452	16	41	40.7	4.95	8	51.6	29	9	20	48.74	0.491	16	36	47.6	2.56	6	50.0
30	9	20	20.14	0.422	16	42	23.5	4.79	8	47.5	30	9	21	0.88	0.520	16	35	44.4	2.70	6	46.3
31	9	20	10.36	0.392	16	43	2.8	4.65	8	43.4	31	9	21	13.70	0.548	16	34	37.9	2.84	6	42.6
32	9	20	1.30	0.362	+16	43	38.7	4.49	8	39.3	32	9	21	27.19	0.576	+16	33	28.2	2.97	6	38.9

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	21.0	20.7	20.2	19.7	Polar Semidiameter	19.7	19.1	18.6	18.0
Horizontal Parallax	1.9	1.9	1.9	1.8	Horizontal Parallax	1.8	1.8	1.7	1.7

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	9 21 13.70	0.548	+16 34 37.9	2.84	6 42.6	1	9 32 54.77	1.390	+15 35 46.3	6.51	4 52.4
2	9 21 27.19	0.576	16 33 28.2	2.97	6 38.9	2	9 33 25.96	1.369	15 33 8.9	6.61	4 49.0
3	9 21 41.35	0.604	16 32 15.4	3.10	6 35.2	3	9 33 57.60	1.328	15 30 29.0	6.71	4 45.6
4	9 21 56.17	0.631	16 30 59.4	3.28	6 31.5	4	9 34 29.71	1.347	15 27 46.6	6.81	4 42.2
5	9 22 11.65	0.658	16 29 40.3	3.36	6 27.9	5	9 35 2.26	1.365	15 25 1.8	6.91	4 38.8
6	9 22 27.79	0.686	16 28 18.1	3.49	6 24.2	6	9 35 35.25	1.323	15 22 14.5	7.02	4 35.4
7	9 22 44.58	0.713	16 26 52.8	3.61	6 20.5	7	9 36 8.68	1.401	15 19 24.8	7.12	4 32.1
8	9 23 2.01	0.739	16 25 24.5	3.74	6 16.9	8	9 36 42.54	1.419	15 16 32.7	7.22	4 28.7
9	9 23 20.08	0.766	16 23 53.1	3.87	6 13.3	9	9 37 16.80	1.436	15 13 38.2	7.32	4 25.3
10	9 23 38.78	0.792	16 22 18.7	3.99	6 9.7	10	9 37 51.49	1.453	15 10 41.4	7.42	4 21.9
11	9 23 58.10	0.817	16 20 41.3	4.12	6 6.0	11	9 38 26.58	1.470	15 7 42.2	7.51	4 18.6
12	9 24 18.04	0.843	16 19 0.9	4.24	6 2.4	12	9 39 2.07	1.486	15 4 40.8	7.60	4 15.2
13	9 24 38.59	0.868	16 17 17.6	4.36	5 58.8	13	9 39 37.95	1.503	15 1 37.1	7.70	4 11.9
14	9 24 59.74	0.893	16 15 31.3	4.48	5 55.3	14	9 40 14.22	1.519	14 58 31.2	7.79	4 8.6
15	9 25 21.48	0.918	16 13 42.1	4.60	5 51.7	15	9 40 50.87	1.534	14 55 23.1	7.88	4 5.3
16	9 25 43.81	0.943	16 11 50.1	4.72	5 48.2	16	9 41 27.89	1.549	14 52 12.8	7.97	4 1.9
17	9 26 6.72	0.968	16 9 55.2	4.84	5 44.6	17	9 42 5.26	1.564	14 49 0.3	8.06	3 58.6
18	9 26 30.20	0.990	16 7 57.4	4.96	5 41.1	18	9 42 42.99	1.579	14 45 45.7	8.15	3 55.3
19	9 26 54.25	1.012	16 5 56.9	5.08	5 37.5	19	9 43 21.07	1.594	14 42 29.0	8.24	3 52.0
20	9 27 18.85	1.036	16 3 53.6	5.19	5 34.0	20	9 43 59.49	1.608	14 39 10.1	8.32	3 48.7
21	9 27 44.00	1.060	16 1 47.6	5.30	5 30.5	21	9 44 38.24	1.622	14 35 49.2	8.41	3 45.4
22	9 28 9.69	1.081	15 59 38.9	5.41	5 27.0	22	9 45 17.32	1.635	14 32 26.2	8.50	3 42.1
23	9 28 35.91	1.103	15 57 27.5	5.52	5 23.5	23	9 45 56.72	1.648	14 29 1.2	8.58	3 38.9
24	9 29 2.66	1.125	15 55 13.4	5.64	5 20.0	24	9 46 36.44	1.661	14 25 34.2	8.66	3 35.6
25	9 29 29.93	1.142	15 52 56.6	5.75	5 16.5	25	9 47 16.47	1.674	14 22 5.2	8.75	3 32.3
26	9 29 57.71	1.167	15 50 37.2	5.86	5 13.1	26	9 47 56.80	1.687	14 18 34.2	8.82	3 29.0
27	9 30 25.99	1.188	15 48 15.2	5.97	5 9.6	27	9 48 37.44	1.699	14 15 1.2	8.91	3 25.8
28	9 30 54.77	1.209	15 45 50.5	6.08	5 6.2	28	9 49 18.38	1.711	14 11 26.3	8.99	3 22.5
29	9 31 24.04	1.229	15 43 23.3	6.18	5 2.7	29	9 49 59.60	1.723	14 7 49.5	9.07	3 19.3
30	9 31 53.80	1.250	15 40 53.5	6.29	4 59.3	30	9 50 41.11	1.735	14 4 10.8	9.15	3 16.1
31	9 32 24.05	1.270	15 38 21.2	6.40	4 55.8	31	9 51 22.90	1.747	14 0 30.2	9.22	3 12.9
32	9 32 54.77	1.290	+15 35 46.3	6.51	4 52.4	32	9 52 4.97	1.768	+13 56 47.7	9.31	3 9.6
Day of the Month,						Day of the Month,					
	1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.	
Polar Semidiameter	18.0	17.5	17.0	16.5		Polar Semidiameter	16.4	16.0	15.7	15.4	
Horizontal Parallax	1.7	1.6	1.6	1.5		Horizontal Parallax	1.5	1.5	1.4	1.4	

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	9 51 22.90	1.747	+14 0 30.2	9.28	3 12.9
2	9 52 4.97	1.758	13 56 47.7	9.31	3 9.6
3	9 52 47.30	1.769	13 53 3.4	9.36	3 6.4
4	9 53 29.89	1.780	13 49 17.3	9.46	3 3.2
5	9 54 12.75	1.791	13 45 29.2	9.53	3 0.0
6	9 54 55.86	1.801	13 41 39.5	9.61	2 56.7
7	9 55 39.21	1.811	13 37 48.0	9.68	2 53.5
8	9 56 22.80	1.821	13 33 54.7	9.73	2 50.3
9	9 57 6.63	1.831	13 29 59.8	9.82	2 47.1
10	9 57 50.68	1.840	13 26 3.2	9.89	2 43.9
11	9 58 34.95	1.849	13 22 5.0	9.96	2 40.7
12	9 59 19.44	1.858	13 18 5.1	10.03	2 37.5
13	10 0 4.13	1.867	13 14 3.6	10.09	2 34.3
14	10 0 49.03	1.875	13 10 0.6	10.16	2 31.1
15	10 1 34.13	1.883	13 5 56.0	10.22	2 27.9
16	10 2 19.42	1.890	13 1 49.9	10.28	2 24.7
17	10 3 4.89	1.898	12 57 42.3	10.34	2 21.6
18	10 3 50.54	1.906	12 53 33.2	10.40	2 18.4
19	10 4 36.37	1.913	12 49 22.7	10.46	2 15.2
20	10 5 22.37	1.920	12 45 10.8	10.52	2 12.0
21	10 6 8.54	1.927	12 40 57.5	10.58	2 8.9
22	10 6 54.87	1.933	12 36 42.8	10.64	2 5.7
23	10 7 41.35	1.940	12 32 26.7	10.70	2 2.6
24	10 8 27.99	1.946	12 28 9.3	10.76	1 59.4
25	10 9 14.78	1.952	12 23 50.6	10.80	1 56.3
26	10 10 1.71	1.958	12 19 30.6	10.86	1 53.1
27	10 10 48.78	1.964	12 15 9.3	10.91	1 50.0
28	10 11 35.99	1.970	12 10 46.7	10.96	1 46.8
29	10 12 23.34	1.976	12 6 22.9	11.01	1 43.7
30	10 13 10.81	1.980	12 1 57.9	11.06	1 40.5
31	10 13 58.40	1.986	11 57 31.7	11.11	1 37.4
32	10 14 46.11	1.990	+11 53 4.4	11.16	1 34.2

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	10 14 46.11	1.990	+11 53 4.4	11.16	1 34.2
2	10 15 33.94	1.996	11 48 35.9	11.21	1 31.1
3	10 16 21.87	1.999	11 44 6.3	11.26	1 27.9
4	10 17 9.91	2.003	11 39 35.6	11.30	1 24.8
5	10 17 58.05	2.007	11 35 3.8	11.34	1 21.7
6	10 18 46.28	2.011	11 30 31.0	11.38	1 18.6
7	10 19 34.60	2.015	11 25 57.2	11.42	1 15.4
8	10 20 23.01	2.018	11 21 22.4	11.46	1 12.3
9	10 21 11.49	2.021	11 16 46.7	11.50	1 9.2
10	10 22 0.05	2.024	11 12 10.2	11.54	1 6.1
11	10 22 48.68	2.027	11 7 32.8	11.58	1 2.9
12	10 23 37.37	2.030	11 2 54.5	11.61	0 59.8
13	10 24 26.12	2.032	10 58 15.4	11.64	0 56.7
14	10 25 14.92	2.034	10 53 35.5	11.67	0 53.6
15	10 26 3.77	2.036	10 48 54.9	11.70	0 50.4
16	10 26 52.66	2.038	10 44 13.6	11.73	0 47.3
17	10 27 41.60	2.040	10 39 31.5	11.76	0 44.2
18	10 28 30.58	2.041	10 34 48.8	11.79	0 41.1
19	10 29 19.50	2.042	10 30 5.4	11.82	0 37.9
20	10 30 8.63	2.043	10 25 21.0	11.84	0 34.8
21	10 30 57.69	2.044	10 20 36.8	11.87	0 31.7
22	10 31 46.77	2.045	10 15 51.6	11.89	0 28.6
23	10 32 35.87	2.046	10 11 5.8	11.91	0 25.4
24	10 33 24.99	2.046	10 6 19.5	11.93	0 22.3
25	10 34 14.12	2.047	10 1 32.7	11.96	0 19.2
26	10 35 3.26	2.047	9 56 45.4	11.98	0 16.1
27	10 35 52.40	2.047	9 51 57.7	12.00	0 13.0
28	10 36 41.54	2.047	9 47 9.5	12.01	0 9.9
29	10 37 30.68	2.047	9 42 20.9	12.03	0 6.8
30	10 38 19.81	2.046	9 37 32.0	12.04	0 3.7
31	10 39 8.92	2.046	9 32 42.7	12.06	{ 22 57.5
32	10 39 58.02	2.045	+ 9 27 53.1	12.07	23 54.3

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	15.4	15.1	14.9	14.7
Horizontal Parallax	1.4	1.4	1.4	1.4

Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	14.7	14.6	14.5	14.5
Horizontal Parallax	1.4	1.3	1.3	1.3

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	10 39 58.02	2.045 +	9 27 53.1	12.07	23 54.3	1	11 3 59.98	1.933 +	7 3 37.3	11.77	22 20.3
2	10 40 47.10	2.044	9 23 3.3	12.08	23 51.2	2	11 4 46.31	1.927	6 58 55.3	11.73	22 17.2
3	10 41 36.15	2.043	9 18 13.2	12.09	23 48.1	3	11 5 32.48	1.920	6 54 14.1	11.70	22 14.0
4	10 42 25.17	2.042	9 13 23.0	12.10	23 45.0	4	11 6 18.47	1.913	6 49 33.8	11.66	22 10.8
5	10 43 14.15	2.040	9 8 32.6	12.10	23 41.8	5	11 7 4.29	1.906	6 44 54.4	11.62	22 7.6
6	10 44 3.09	2.038	9 3 42.1	12.10	23 38.7	6	11 7 49.93	1.898	6 40 16.0	11.58	22 4.4
7	10 44 51.98	2.036	8 58 51.5	12.11	23 35.6	7	11 8 35.39	1.890	6 35 38.5	11.54	22 1.2
8	10 45 40.82	2.034	8 54 0.8	12.11	23 32.5	8	11 9 20.66	1.881	6 31 2.0	11.50	21 58.0
9	10 46 29.60	2.031	8 49 10.1	12.10	23 29.3	9	11 10 5.73	1.873	6 26 26.6	11.45	21 54.8
10	10 47 18.32	2.029	8 44 19.5	12.10	23 26.2	10	11 10 50.61	1.866	6 21 52.3	11.40	21 51.6
11	10 48 6.97	2.026	8 39 28.9	12.10	23 23.1	11	11 11 35.28	1.858	6 17 19.1	11.35	21 48.4
12	10 48 55.56	2.023	8 34 38.4	12.09	23 20.0	12	11 12 19.74	1.847	6 12 47.1	11.30	21 45.2
13	10 49 44.07	2.020	8 29 48.1	12.09	23 16.8	13	11 13 3.99	1.838	6 8 16.3	11.25	21 42.0
14	10 50 32.50	2.016	8 24 57.9	12.09	23 13.7	14	11 13 48.02	1.829	6 3 46.8	11.20	21 38.8
15	10 51 20.85	2.013	8 20 7.9	12.08	23 10.6	15	11 14 31.83	1.820	5 59 18.5	11.15	21 35.6
16	10 52 9.12	2.009	8 15 18.0	12.07	23 7.5	16	11 15 15.41	1.811	5 54 51.6	11.09	21 32.4
17	10 52 57.29	2.005	8 10 28.4	12.06	23 4.3	17	11 15 58.76	1.801	5 50 26.1	11.03	21 29.2
18	10 53 45.36	2.001	8 5 39.1	12.06	23 1.2	18	11 16 41.87	1.791	5 46 2.0	10.97	21 26.0
19	10 54 33.34	1.997	8 0 50.1	12.04	22 58.1	19	11 17 24.74	1.781	5 41 39.3	10.91	21 22.8
20	10 55 21.22	1.993	7 56 1.4	12.02	22 55.0	20	11 18 7.36	1.771	5 37 18.0	10.85	21 19.6
21	10 56 8.99	1.988	7 51 13.1	12.00	22 51.8	21	11 18 49.73	1.760	5 32 58.3	10.79	21 16.3
22	10 56 56.65	1.983	7 46 25.2	11.99	22 48.7	22	11 19 31.85	1.749	5 28 40.2	10.72	21 13.1
23	10 57 44.20	1.979	7 41 37.7	11.97	22 45.5	23	11 20 13.70	1.738	5 24 23.6	10.66	21 9.8
24	10 58 31.63	1.974	7 36 50.7	11.95	22 42.4	24	11 20 55.29	1.727	5 20 8.7	10.59	21 6.6
25	10 59 18.94	1.968	7 32 4.1	11.93	22 39.2	25	11 21 36.61	1.716	5 15 55.4	10.51	21 3.3
26	11 0 6.12	1.963	7 27 18.1	11.90	22 36.1	26	11 22 17.65	1.704	5 11 43.9	10.44	21 0.1
27	11 0 53.17	1.958	7 22 32.7	11.88	22 32.9	27	11 22 58.40	1.692	5 7 34.1	10.37	20 56.8
28	11 1 40.09	1.952	7 17 47.8	11.86	22 29.8	28	11 23 38.86	1.680	5 3 26.2	10.29	20 53.5
29	11 2 26.87	1.946	7 13 3.6	11.83	22 26.6	29	11 24 19.03	1.667	4 59 20.2	10.21	20 50.2
30	11 3 13.50	1.940	7 8 20.1	11.80	22 23.5	30	11 24 58.89	1.654	4 55 16.1	10.13	20 47.0
31	11 3 59.98	1.933	7 3 37.3	11.77	22 20.3	31	11 25 38.45	1.641	4 51 14.0	10.04	20 43.7
32	11 4 46.31	1.927 +	6 58 55.3	11.73	22 17.2	32	11 26 17.69	1.628 +	4 47 13.9	9.96	20 40.4
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		"	"	"	"	Polar Semidiameter		"	"	"	"
Horizontal Parallax		14.5	14.5	14.6	14.7	Horizontal Parallax		14.7	14.9	15.1	15.4
		1.3	1.3	1.4	1.4			1.4	1.4	1.4	1.4

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s 11 26 17.69	s 1-628	+ ° ' " 4 47 13.9	" 9-08	h m 20 40.4	1	h m s 11 42 57.20	s 1-109	+ ° ' " 3 6 29.5	" 6-55	h m 18 58.9
2	11 26 56.60	1-614	4 43 15.8	9-87	20 37.1	2	11 43 23.56	1-087	3 3 54.1	6-40	18 55.4
3	11 27 35.19	1-600	4 39 19.9	9-78	20 33.8	3	11 43 49.39	1-066	3 1 22.2	6-28	18 51.9
4	11 28 13.44	1-586	4 35 26.1	9-69	20 30.5	4	11 44 14.69	1-042	2 58 53.9	6-10	18 48.4
5	11 28 51.34	1-571	4 31 34.4	9-60	20 27.2	5	11 44 39.45	1-020	2 56 29.1	6-06	18 44.9
6	11 29 28.90	1-556	4 27 45.0	9-51	20 23.9	6	11 45 3.69	0-998	2 54 8.0	6-00	18 41.3
7	11 30 6.10	1-541	4 23 57.9	9-41	20 20.6	7	11 45 27.37	0-976	2 51 50.5	6-06	18 37.8
8	11 30 42.94	1-626	4 20 13.2	9-31	20 17.3	8	11 45 50.49	0-962	2 49 36.6	6-50	18 34.2
9	11 31 19.41	1-611	4 16 30.9	9-21	20 14.0	9	11 46 13.06	0-938	2 47 26.5	6-34	18 30.7
10	11 31 55.51	1-496	4 12 51.0	9-11	20 10.6	10	11 46 35.06	0-904	2 45 20.2	6-18	18 27.1
11	11 32 31.24	1-480	4 9 13.6	9-01	20 7.3	11	11 46 56.49	0-880	2 43 17.6	6-03	18 23.5
12	11 33 6.58	1-464	4 5 38.7	8-90	20 3.9	12	11 47 17.35	0-866	2 41 18.8	6-07	18 19.9
13	11 33 41.53	1-448	4 2 6.3	8-80	20 0.6	13	11 47 37.63	0-831	2 39 23.9	6-10	18 16.3
14	11 34 16.09	1-431	3 58 36.5	8-69	19 57.2	14	11 47 57.32	0-807	2 37 33.0	6-04	18 12.7
15	11 34 50.24	1-414	3 55 9.3	8-58	19 53.9	15	11 48 16.41	0-783	2 35 46.0	6-08	18 9.1
16	11 35 23.99	1-397	3 51 44.8	8-46	19 50.5	16	11 48 34.91	0-758	2 34 2.9	6-21	18 5.4
17	11 35 57.33	1-380	3 48 23.1	8-34	19 47.1	17	11 48 52.80	0-732	2 32 23.9	6-04	18 1.8
18	11 36 30.25	1-363	3 45 4.1	8-23	19 43.7	18	11 49 10.09	0-707	2 30 48.9	6-07	17 58.1
19	11 37 2.75	1-345	3 41 47.9	8-11	19 40.3	19	11 49 26.76	0-681	2 29 17.9	6-10	17 54.5
20	11 37 34.82	1-327	3 38 34.6	8-00	19 36.9	20	11 49 42.80	0-656	2 27 51.1	6-08	17 50.8
21	11 38 6.45	1-309	3 35 24.1	7-88	19 33.5	21	11 49 58.22	0-630	2 26 28.5	6-06	17 47.1
22	11 38 37.64	1-290	3 32 16.5	7-75	19 30.1	22	11 50 13.02	0-603	2 25 10.0	6-18	17 43.4
23	11 39 8.38	1-271	3 29 12.0	7-63	19 26.7	23	11 50 27.19	0-576	2 23 55.8	6-00	17 39.7
24	11 39 38.66	1-252	3 26 10.5	7-49	19 23.2	24	11 50 40.70	0-549	2 22 45.9	6-02	17 36.0
25	11 40 8.47	1-233	3 23 12.1	7-36	19 19.8	25	11 50 53.55	0-521	2 21 40.2	6-04	17 32.3
26	11 40 37.81	1-213	3 20 16.8	7-23	19 16.3	26	11 51 5.73	0-493	2 20 39.0	6-06	17 28.5
27	11 41 6.68	1-193	3 17 24.7	7-10	19 12.9	27	11 51 17.25	0-466	2 19 42.1	6-28	17 24.8
28	11 41 35.06	1-172	3 14 35.9	6-96	19 9.4	28	11 51 28.11	0-438	2 18 49.6	6-10	17 21.0
29	11 42 2.94	1-151	3 11 50.4	6-82	19 5.9	29	11 51 38.30	0-410	2 18 1.5	1-01	17 17.2
30	11 42 30.32	1-130	3 9 8.3	6-69	19 2.4	30	11 51 47.82	0-382	2 17 17.9	1-13	17 13.4
31	11 42 57.20	1-109	3 6 29.5	6-55	18 58.9	31	11 51 56.66	0-354	2 16 38.8	1-04	17 9.6
32	11 43 23.56	1-087	+ 3 3 54.1	6-40	18 55.4	32	11 52 4.82	0-326	+ 2 16 4.1	1-25	17 5.8
Day of the Month,						Day of the Month,					
1st.						1st.					
11th.						11th.					
21st.						21st.					
31st.						31st.					
Polar Semidiameter						Polar Semidiameter					
Horizontal Parallax						Horizontal Parallax					
15.4						16.6					
1.4						1.5					
15.8						17.1					
1.5						1.6					
16.2						17.6					
1.5						1.6					
16.6						18.1					
1.5						1.7					

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	10 46 33.18	-0.200	+ 9 41 13.3	+1.87	15 50.4	1	10 41 9.69	-0.692	+10 20 48.1	+4.24	13 52.1
2	10 46 28.18	-0.217	9 41 59.4	1.97	15 55.4	2	10 40 54.40	-0.642	10 22 30.4	4.29	13 47.9
3	10 46 22.78	-0.233	9 42 47.9	2.07	15 51.4	3	10 40 38.88	-0.661	10 24 13.8	4.32	13 43.7
4	10 46 16.99	-0.260	9 43 38.7	2.16	15 47.3	4	10 40 23.14	-0.690	10 25 58.2	4.37	13 39.5
5	10 46 10.80	-0.266	9 44 31.8	2.26	15 43.3	5	10 40 7.19	-0.699	10 27 43.6	4.41	13 35.3
6	10 46 4.21	-0.283	9 45 27.1	2.36	15 39.2	6	10 39 51.04	-0.677	10 29 29.9	4.45	13 31.1
7	10 45 57.22	-0.299	9 46 24.7	2.45	15 35.2	7	10 39 34.69	-0.685	10 31 17.0	4.48	13 26.9
8	10 45 49.84	-0.315	9 47 24.6	2.54	15 31.1	8	10 39 18.16	-0.692	10 33 4.9	4.51	13 22.7
9	10 45 42.08	-0.331	9 48 26.7	2.63	15 27.0	9	10 39 1.45	-0.700	10 34 53.5	4.54	13 18.5
10	10 45 33.95	-0.347	9 49 30.9	2.72	15 23.0	10	10 38 44.58	-0.706	10 36 42.8	4.56	13 14.3
11	10 45 25.44	-0.362	9 50 37.2	2.81	15 18.9	11	10 38 27.56	-0.712	10 38 32.6	4.59	13 10.1
12	10 45 16.55	-0.378	9 51 45.6	2.89	15 14.8	12	10 38 10.40	-0.718	10 40 22.9	4.61	13 5.9
13	10 45 7.30	-0.393	9 52 56.1	2.98	15 10.7	13	10 37 53.10	-0.724	10 42 13.7	4.63	13 1.6
14	10 44 57.68	-0.408	9 54 8.6	3.06	15 6.6	14	10 37 35.67	-0.729	10 44 4.9	4.64	12 57.4
15	10 44 47.71	-0.423	9 55 23.0	3.14	15 2.5	15	10 37 18.13	-0.733	10 45 56.4	4.65	12 53.2
16	10 44 37.39	-0.437	9 56 39.4	3.22	14 58.4	16	10 37 0.49	-0.737	10 47 48.2	4.66	12 49.0
17	10 44 26.72	-0.451	9 57 57.7	3.30	14 54.3	17	10 36 42.76	-0.740	10 49 40.1	4.67	12 44.8
18	10 44 15.72	-0.465	9 59 17.9	3.38	14 50.2	18	10 36 24.95	-0.743	10 51 32.2	4.67	12 40.5
19	10 44 4.38	-0.479	10 0 39.8	3.45	14 46.1	19	10 36 7.07	-0.746	10 53 24.4	4.67	12 36.3
20	10 43 52.72	-0.492	10 2 3.5	3.52	14 42.0	20	10 35 49.12	-0.749	10 55 16.6	4.67	12 32.1
21	10 43 40.74	-0.506	10 3 28.9	3.59	14 37.9	21	10 35 31.12	-0.751	10 57 8.7	4.67	12 27.8
22	10 43 28.44	-0.519	10 4 56.0	3.66	14 33.7	22	10 35 13.08	-0.752	10 59 0.7	4.66	12 23.6
23	10 43 15.83	-0.531	10 6 24.7	3.73	14 29.6	23	10 34 55.01	-0.753	11 0 52.5	4.66	12 19.3
24	10 43 2.93	-0.544	10 7 54.9	3.79	14 25.4	24	10 34 36.91	-0.754	11 2 44.2	4.65	12 15.1
25	10 42 49.74	-0.556	10 9 26.7	3.85	14 21.3	25	10 34 18.80	-0.755	11 4 35.6	4.64	12 10.9
26	10 42 36.26	-0.568	10 11 0.0	3.92	14 17.1	26	10 34 0.69	-0.754	11 6 26.6	4.62	12 6.6
27	10 42 22.49	-0.579	10 12 34.7	3.96	14 13.0	27	10 33 42.59	-0.754	11 8 17.2	4.60	12 2.4
28	10 42 8.45	-0.591	10 14 10.8	4.03	14 8.8	28	10 33 24.51	-0.753	11 10 7.4	4.59	11 58.1
29	10 41 54.14	-0.602	10 15 48.2	4.09	14 4.6	29	10 33 6.46	-0.751	11 11 57.1	4.56	11 53.9
30	10 41 39.57	-0.612	10 17 26.9	4.14	14 0.5	30	10 32 48.44	-0.750	11 13 46.2	4.53	11 49.6
31	10 41 24.75	-0.622	10 19 6.9	4.19	13 56.3	31	10 32 30.46	-0.748	11 15 34.7	4.51	11 45.4
32	10 41 9.69	-0.632	+10 20 48.1	+4.24	13 52.1	32	10 32 12.54	-0.745	+11 17 22.5	+4.48	11 41.2
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		" 8.9	" 9.1	" 9.2	" 9.3	Polar Semidiameter		" 9.3	" 9.4	" 9.4	" 9.4
Horizontal Parallax		1.0	1.0	1.0	1.0	Horizontal Parallax		1.0	1.0	1.0	1.0

GREENWICH MEAN TIME.

MARCH.

APRIL.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	h	m	s		°	'	"				h	m	s		°	'	"		
1	10	33	6.46	-0.751	+11	11	57.1	+4.56	11 53.9	1	10	24	53.13	-0.517	+11	59	23.8	+2.79	9 43.8
2	10	32	48.44	-0.750	11	13	46.2	4.53	11 49.6	2	10	24	40.88	-0.504	12	0	29.8	2.71	9 39.7
3	10	32	30.46	-0.748	11	15	34.7	4.51	11 45.4	3	10	24	28.94	-0.491	12	1	33.8	2.63	9 35.6
4	10	32	12.54	-0.745	11	17	22.5	4.48	11 41.2	4	10	24	17.32	-0.478	12	2	35.8	2.54	9 31.5
5	10	31	54.69	-0.743	11	19	9.5	4.44	11 37.0	5	10	24	6.01	-0.464	12	3	35.8	2.46	9 27.4
6	10	31	36.91	-0.739	11	20	55.6	4.40	11 32.8	6	10	23	55.03	-0.450	12	4	33.7	2.37	9 23.3
7	10	31	19.22	-0.735	11	22	40.9	4.37	11 28.6	7	10	23	44.39	-0.436	12	5	29.4	2.28	9 19.2
8	10	31	1.63	-0.731	11	24	25.3	4.33	11 24.3	8	10	23	34.09	-0.423	12	6	23.0	2.19	9 15.1
9	10	30	44.15	-0.726	11	26	8.7	4.29	11 20.1	9	10	23	24.12	-0.408	12	7	14.4	2.10	9 11.0
10	10	30	26.79	-0.721	11	27	51.2	4.25	11 15.9	10	10	23	14.50	-0.393	12	8	3.7	2.01	9 6.9
11	10	30	9.55	-0.716	11	29	32.6	4.20	11 11.7	11	10	23	5.24	-0.378	12	8	50.8	1.91	9 2.8
12	10	29	52.45	-0.709	11	31	12.8	4.15	11 7.4	12	10	22	56.34	-0.363	12	9	35.6	1.82	8 58.7
13	10	29	35.50	-0.703	11	32	51.8	4.10	11 3.2	13	10	22	47.80	-0.348	12	10	18.2	1.73	8 54.6
14	10	29	18.71	-0.696	11	34	29.5	4.04	10 59.0	14	10	22	39.62	-0.333	12	10	58.5	1.63	8 50.6
15	10	29	2.09	-0.689	11	36	5.8	3.99	10 54.8	15	10	22	31.80	-0.318	12	11	36.6	1.54	8 46.5
16	10	28	45.64	-0.682	11	37	40.8	3.93	10 50.6	16	10	22	24.36	-0.303	12	12	12.4	1.44	8 42.5
17	10	28	29.37	-0.674	11	39	14.4	3.87	10 46.4	17	10	22	17.30	-0.288	12	12	45.9	1.35	8 38.5
18	10	28	13.30	-0.668	11	40	46.6	3.81	10 42.2	18	10	22	10.62	-0.270	12	13	17.1	1.26	8 34.4
19	10	27	57.44	-0.659	11	42	17.3	3.75	10 38.0	19	10	22	4.32	-0.253	12	13	46.1	1.16	8 30.4
20	10	27	41.79	-0.647	11	43	46.5	3.68	10 33.8	20	10	21	58.40	-0.239	12	14	12.7	1.06	8 26.4
21	10	27	26.36	-0.638	11	45	14.1	3.62	10 29.6	21	10	21	52.87	-0.223	12	14	37.0	0.96	8 22.3
22	10	27	11.16	-0.628	11	46	40.1	3.55	10 25.4	22	10	21	47.72	-0.206	12	14	50.0	0.87	8 18.3
23	10	26	56.19	-0.619	11	48	4.4	3.48	10 21.2	23	10	21	42.96	-0.190	12	15	18.7	0.77	8 14.3
24	10	26	41.46	-0.609	11	49	27.0	3.41	10 17.0	24	10	21	38.50	-0.174	12	15	36.1	0.68	8 10.3
25	10	26	26.07	-0.598	11	50	48.0	3.34	10 12.9	25	10	21	34.61	-0.158	12	15	51.2	0.58	8 6.3
26	10	26	12.74	-0.587	11	52	7.2	3.26	10 8.7	26	10	21	31.02	-0.141	12	16	3.9	0.48	8 2.3
27	10	25	58.78	-0.576	11	53	24.6	3.19	10 4.5	27	10	21	27.83	-0.125	12	16	14.3	0.39	7 58.3
28	10	25	45.09	-0.565	11	54	40.2	3.11	10 0.4	28	10	21	25.04	-0.108	12	16	22.4	0.29	7 54.3
29	10	25	31.67	-0.553	11	55	53.9	3.03	9 56.2	29	10	21	22.64	-0.092	12	16	28.2	0.19	7 50.4
30	10	25	18.53	-0.541	11	57	5.8	2.95	9 52.1	30	10	21	20.63	-0.076	12	16	31.6	+0.09	7 46.4
31	10	25	5.68	-0.529	11	58	15.8	2.88	9 48.0	31	10	21	19.03	-0.058	12	16	32.7	0.00	7 42.4
32	10	24	53.13	-0.517	+11	59	23.8	+2.79	9 43.8	32	10	21	17.83	-0.043	+12	16	31.5	-0.10	7 38.5

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	9.4	9.4	9.3	9.2	Polar Semidiameter	9.2	9.1	9.0	8.8
Horizontal Parallax	1.0	1.0	1.0	1.0	Horizontal Parallax	1.0	1.0	1.0	1.0

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	h m s	s	° ' "	"	h m	1	h m s	s	° ' "	"	h m
1	10 21 19.03	-0.068	+12 16 32.7	-0.00	7 42.4	1	10 23 45.82	+0.443	+11 58 15.5	-2.87	5 43.0
2	10 21 17.83	-0.042	12 16 31.5	-0.10	7 38.5	2	10 23 56.62	-0.487	11 57 5.6	-2.96	5 39.2
3	10 21 17.03	-0.025	12 16 27.9	-0.30	7 34.5	3	10 24 7.78	-0.472	11 55 53.6	-2.04	5 35.5
4	10 21 16.63	-0.008	12 16 22.0	-0.29	7 30.6	4	10 24 19.29	-0.487	11 54 39.6	-2.12	5 31.7
5	10 21 16.63	+0.008	12 16 13.8	-0.39	7 26.7	5	10 24 31.16	-0.302	11 53 23.6	-2.21	5 28.0
6	10 21 17.03	-0.035	12 16 3.2	-0.49	7 22.7	6	10 24 43.38	-0.516	11 52 5.6	-2.29	5 24.3
7	10 21 17.84	-0.043	12 15 50.2	-0.59	7 18.8	7	10 24 55.94	-0.530	11 50 45.7	-2.37	5 20.6
8	10 21 19.05	-0.069	12 15 34.9	-0.69	7 14.9	8	10 25 8.84	-0.545	11 49 23.9	-2.45	5 16.9
9	10 21 20.66	-0.076	12 15 17.3	-0.78	7 11.0	9	10 25 22.08	-0.550	11 48 0.1	-2.53	5 13.2
10	10 21 22.67	-0.093	12 14 57.4	-0.88	7 7.1	10	10 25 35.66	-0.573	11 46 34.4	-2.61	5 9.5
11	10 21 25.09	-0.109	12 14 35.2	-0.97	7 3.2	11	10 25 49.57	-0.585	11 45 6.9	-2.69	5 5.8
12	10 21 27.91	-0.126	12 14 10.7	-1.07	6 59.3	12	10 26 3.81	-0.600	11 43 37.5	-2.76	5 2.1
13	10 21 31.13	-0.143	12 13 43.9	-1.17	6 55.4	13	10 26 18.37	-0.613	11 42 6.3	-2.84	4 58.4
14	10 21 34.75	-0.150	12 13 14.7	-1.26	6 51.6	14	10 26 33.24	-0.626	11 40 33.2	-2.92	4 54.7
15	10 21 38.77	-0.176	12 12 43.3	-1.36	6 47.7	15	10 26 48.43	-0.640	11 38 58.3	-2.99	4 51.0
16	10 21 43.18	-0.192	12 12 9.6	-1.45	6 43.9	16	10 27 3.94	-0.660	11 37 21.6	-3.06	4 47.3
17	10 21 47.98	-0.208	12 11 33.7	-1.54	6 40.1	17	10 27 19.76	-0.665	11 35 43.2	-3.14	4 43.6
18	10 21 53.17	-0.226	12 10 55.6	-1.63	6 36.2	18	10 27 35.88	-0.678	11 34 3.1	-3.21	4 40.0
19	10 21 58.76	-0.241	12 10 15.3	-1.72	6 32.4	19	10 27 52.30	-0.690	11 32 21.2	-3.28	4 36.3
20	10 22 4.73	-0.267	12 9 32.8	-1.82	6 28.6	20	10 28 9.02	-0.705	11 30 37.6	-3.35	4 32.7
21	10 22 11.09	-0.273	12 8 48.1	-1.91	6 24.7	21	10 28 26.04	-0.715	11 28 52.3	-3.42	4 29.1
22	10 22 17.83	-0.289	12 8 1.2	-2.00	6 20.9	22	10 28 43.35	-0.727	11 27 5.4	-3.49	4 25.4
23	10 22 24.95	-0.305	12 7 12.1	-2.08	6 17.1	23	10 29 0.94	-0.739	11 25 16.9	-3.56	4 21.8
24	10 22 32.45	-0.320	12 6 20.9	-2.16	6 13.3	24	10 29 18.82	-0.751	11 23 26.7	-3.62	4 18.2
25	10 22 40.33	-0.326	12 5 27.5	-2.27	6 9.5	25	10 29 36.98	-0.762	11 21 34.9	-3.69	4 14.5
26	10 23 48.58	-0.351	12 4 32.0	-2.36	6 5.7	26	10 29 55.41	-0.774	11 19 41.5	-3.76	4 10.9
27	10 23 57.20	-0.367	12 3 34.4	-2.44	6 1.9	27	10 30 14.12	-0.785	11 17 46.6	-3.83	4 7.3
28	10 23 6.19	-0.382	12 2 34.8	-2.53	5 58.1	28	10 30 33.10	-0.796	11 15 50.1	-3.89	4 3.7
29	10 23 15.55	-0.396	12 1 33.1	-2.61	5 54.3	29	10 30 52.34	-0.807	11 13 52.1	-3.96	4 0.0
30	10 23 25.28	-0.412	12 0 29.3	-2.70	5 50.5	30	10 31 11.84	-0.818	11 11 52.6	-4.01	3 56.4
31	10 23 35.37	-0.428	11 59 23.4	-2.79	5 46.7	31	10 31 31.60	-0.829	11 9 51.5	-4.07	3 52.8
32	10 23 45.82	+0.443	+11 58 15.5	-2.87	5 43.0	32	10 31 51.62	+0.840	+11 7 49.0	-4.12	3 49.2
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		8.8	8.6	8.4	8.3	Polar Semidiameter		8.3	8.1	8.0	7.9
Horizontal Parallax		1.0	0.9	0.9	0.9	Horizontal Parallax		0.9	0.9	0.9	0.9

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	^s	^h ^m		^h ^m ^s	^s	[°] ['] ["]	^s	^h ^m
1	10 31 31.60	+0.828	+11 9 51.5	-5.07	3 52.8	1	10 43 31.65	+1.080	+9 56 53.1	-6.55	2 2.9
2	10 31 51.62	0.840	11 7 49.0	-5.12	3 49.2	2	10 43 57.65	1.088	9 54 15.4	-6.59	1 59.4
3	10 32 11.90	0.860	11 5 45.1	-5.19	3 45.6	3	10 44 23.78	1.091	9 51 36.9	-6.62	1 55.9
4	10 32 32.42	0.880	11 3 39.7	-5.28	3 42.0	4	10 44 50.04	1.097	9 48 57.6	-6.65	1 52.4
5	10 32 53.19	0.870	11 1 32.9	-5.31	3 38.4	5	10 45 16.43	1.102	9 46 17.6	-6.68	1 48.9
6	10 33 14.20	0.880	10 59 24.7	-5.37	3 34.8	6	10 45 42.94	1.107	9 43 36.9	-6.71	1 45.4
7	10 33 35.44	0.890	10 57 15.1	-5.43	3 31.2	7	10 46 9.56	1.111	9 40 55.5	-6.74	1 41.9
8	10 33 56.92	0.900	10 55 4.1	-5.49	3 27.7	8	10 46 36.29	1.116	9 38 13.4	-6.77	1 38.4
9	10 34 18.63	0.909	10 52 51.8	-5.54	3 24.1	9	10 47 3.13	1.120	9 35 30.7	-6.79	1 34.9
10	10 34 40.56	0.918	10 50 38.2	-5.59	3 20.5	10	10 47 30.07	1.125	9 32 47.4	-6.82	1 31.4
11	10 35 2.71	0.928	10 48 23.3	-5.65	3 17.0	11	10 47 57.11	1.129	9 30 3.4	-6.84	1 27.9
12	10 35 25.08	0.937	10 46 7.1	-5.70	3 13.4	12	10 48 24.24	1.132	9 27 18.9	-6.86	1 24.5
13	10 35 47.67	0.945	10 43 49.7	-5.75	3 9.9	13	10 48 51.46	1.136	9 24 33.9	-6.89	1 21.0
14	10 36 10.46	0.954	10 41 31.1	-5.80	3 6.3	14	10 49 18.77	1.140	9 21 48.4	-6.91	1 17.5
15	10 36 33.45	0.962	10 39 11.3	-5.86	3 2.8	15	10 49 46.16	1.143	9 19 2.4	-6.93	1 14.0
16	10 36 56.64	0.970	10 36 50.3	-5.90	2 59.3	16	10 50 13.63	1.146	9 16 15.9	-6.95	1 10.5
17	10 37 20.03	0.978	10 34 28.2	-5.94	2 55.7	17	10 50 41.17	1.149	9 13 28.9	-6.97	1 7.1
18	10 37 43.61	0.986	10 32 5.0	-5.99	2 52.2	18	10 51 8.78	1.152	9 10 41.5	-6.98	1 3.6
19	10 38 7.37	0.994	10 29 40.7	-6.04	2 48.6	19	10 51 36.46	1.155	9 7 53.7	-7.00	1 0.1
20	10 38 31.32	1.002	10 27 15.3	-6.08	2 45.1	20	10 52 4.20	1.157	9 5 5.6	-7.01	0 56.7
21	10 38 55.45	1.009	10 24 48.8	-6.13	2 41.6	21	10 52 32.00	1.160	9 2 17.1	-7.02	0 53.2
22	10 39 19.75	1.016	10 22 21.3	-6.17	2 38.0	22	10 52 59.86	1.162	8 59 28.3	-7.04	0 49.8
23	10 39 44.23	1.023	10 19 52.7	-6.21	2 34.5	23	10 53 27.77	1.164	8 56 39.2	-7.05	0 46.3
24	10 40 8.87	1.030	10 17 23.1	-6.25	2 31.0	24	10 53 55.73	1.166	8 53 49.7	-7.07	0 42.8
25	10 40 33.68	1.037	10 14 52.5	-6.29	2 27.4	25	10 54 23.74	1.168	8 50 59.9	-7.08	0 39.4
26	10 40 58.65	1.044	10 12 21.0	-6.33	2 23.9	26	10 54 51.79	1.169	8 48 9.9	-7.09	0 35.9
27	10 41 23.78	1.050	10 9 48.6	-6.37	2 20.4	27	10 55 19.87	1.171	8 45 19.7	-7.10	0 32.5
28	10 41 49.06	1.056	10 7 15.3	-6.41	2 16.9	28	10 55 47.99	1.173	8 42 29.3	-7.10	0 29.0
29	10 42 14.49	1.063	10 4 41.1	-6.44	2 13.4	29	10 56 16.14	1.175	8 39 38.7	-7.11	0 25.5
30	10 42 40.07	1.069	10 2 6.0	-6.48	2 9.9	30	10 56 44.32	1.174	8 36 47.9	-7.12	0 22.0
31	10 43 5.79	1.075	9 59 30.0	-6.52	2 6.4	31	10 57 12.52	1.175	8 33 57.0	-7.12	0 18.6
32	10 43 31.65	+1.080	+9 56 53.1	-6.55	2 2.9	32	10 57 40.74	+1.176	+8 31 5.9	-7.13	0 15.1
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		7.9	7.8	7.7	7.7	Polar Semidiameter		7.6	7.6	7.6	7.5
Horizontal Parallax		0.9	0.9	0.8	0.8	Horizontal Parallax		0.8	0.8	0.8	0.8

GREENWICH MEAN TIME.

SEPTEMBER.										OCTOBER.																	
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.								
	Noon.				Noon.						Noon.																
	h	m	s	"	°	'	"	"	h	m		h	m	s	"	°	'	"	"	h	m						
1	10	57	40.74	+1.176	+	8	31	5.9	-7.13	0	15.1	1	11	11	35.72	+1.119	+	7	7	3.6	-6.72	22	27.5				
2	10	58	8.98	1.177		8	28	14.8	7.13	0	11.6	2	11	12	2.53	1.115		7	4	22.8	-6.69	22	24.1				
3	10	58	37.23	1.177		8	25	23.7	7.13	0	8.1	3	11	12	29.23	1.110		7	1	42.7	-6.65	22	20.6				
4	10	59	5.48	1.177		8	22	32.6	7.13	0	4.7	4	11	12	55.81	1.105		6	59	3.4	-6.62	22	17.1				
5	10	59	33.73	1.177		8	19	41.5	7.13	0	1.2	5	11	13	22.26	1.099		6	56	24.9	-6.59	22	13.6				
6	11	0	1.98	1.177		8	16	50.4	7.13	23	54.3	6	11	13	48.58	1.094		6	53	47.2	-6.55	22	10.1				
7	11	0	30.22	1.176		8	13	59.4	7.12	23	50.8	7	11	14	14.78	1.089		6	51	10.4	-6.51	22	6.6				
8	11	0	58.45	1.176		8	11	8.5	7.12	23	47.3	8	11	14	40.85	1.083		6	48	34.6	-6.47	22	3.1				
9	11	1	26.67	1.175		8	8	17.7	7.11	23	43.9	9	11	15	6.78	1.077		6	45	59.7	-6.43	21	59.6				
10	11	1	54.87	1.175		8	5	27.1	7.10	23	40.4	10	11	15	32.57	1.071		6	43	25.8	-6.39	21	56.1				
11	11	2	23.05	1.174		8	2	36.7	7.10	23	37.0	11	11	15	58.21	1.066		6	40	52.9	-6.35	21	52.6				
12	11	2	51.20	1.172		7	59	46.5	7.09	23	33.5	12	11	16	23.70	1.059		6	38	21.0	-6.31	21	49.1				
13	11	3	19.32	1.171		7	56	56.5	7.08	23	30.0	13	11	16	49.04	1.052		6	35	50.2	-6.26	21	45.6				
14	11	3	47.40	1.169		7	54	6.8	7.07	23	26.6	14	11	17	14.22	1.046		6	33	20.4	-6.22	21	42.1				
15	11	4	15.44	1.167		7	51	17.3	7.06	23	23.1	15	11	17	39.24	1.039		6	30	51.7	-6.17	21	38.6				
16	11	4	43.44	1.166		7	48	28.1	7.04	23	19.7	16	11	18	4.10	1.032		6	28	24.2	-6.13	21	35.0				
17	11	5	11.39	1.164		7	45	39.3	7.03	23	16.2	17	11	18	28.79	1.025		6	25	57.8	-6.08	21	31.5				
18	11	5	39.29	1.161		7	42	50.8	7.01	23	12.7	18	11	18	53.31	1.018		6	23	32.6	-6.03	21	27.9				
19	11	6	7.14	1.159		7	40	2.7	7.00	23	9.3	19	11	19	17.65	1.010		6	21	8.6	-5.98	21	24.4				
20	11	6	34.93	1.157		7	37	15.0	6.98	23	5.8	20	11	19	41.81	1.003		6	18	45.8	-5.93	21	20.9				
21	11	7	2.66	1.154		7	34	27.7	6.96	23	2.3	21	11	20	5.79	0.995		6	16	24.3	-5.87	21	17.3				
22	11	7	30.33	1.151		7	31	40.8	6.94	22	58.8	22	11	20	29.59	0.987		6	14	4.1	-5.81	21	13.8				
23	11	7	57.93	1.148		7	28	54.4	6.92	22	55.4	23	11	20	53.19	0.979		6	11	45.2	-5.76	21	10.3				
24	11	8	25.45	1.145		7	26	8.5	6.90	22	51.9	24	11	21	16.59	0.971		6	9	27.7	-5.70	21	6.7				
25	11	8	52.89	1.142		7	23	23.1	6.88	22	48.4	25	11	21	39.79	0.963		6	7	11.5	-5.65	21	3.2				
26	11	9	20.25	1.138		7	20	38.3	6.86	22	44.9	26	11	22	2.79	0.954		6	4	56.7	-5.59	20	59.6				
27	11	9	47.53	1.135		7	17	54.1	6.83	22	41.5	27	11	22	25.58	0.945		6	2	43.3	-5.53	20	56.1				
28	11	10	14.72	1.131		7	15	10.5	6.80	22	38.0	28	11	22	48.15	0.936		6	0	31.4	-5.46	20	52.5				
29	11	10	41.81	1.127		7	12	27.5	6.78	22	34.5	29	11	23	10.50	0.927		5	58	21.0	-5.40	20	48.9				
30	11	11	8.81	1.123		7	9	45.2	6.75	22	31.0	30	11	23	32.63	0.917		5	56	12.1	-5.34	20	45.4				
31	11	11	35.72	1.119		7	7	3.6	6.72	22	27.5	31	11	23	54.54	0.908		5	54	4.8	-5.27	20	41.8				
32	11	12	2.53	+1.115	+	7	4	22.8	-6.69	22	24.1	32	11	24	16.22	+0.898	+	5	51	59.1	-5.20	20	38.2				
Day of the Month,										1st.	11th.	21st.	31st.	Day of the Month,										1st.	11th.	21st.	31st.
Polar Semidiameter										7.5	7.5	7.6	7.6	Polar Semidiameter										7.6	7.7	7.7	7.8
Horizontal Parallax										0.8	0.8	0.8	0.8	Horizontal Parallax										0.8	0.8	0.8	0.9

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m		^h ^m ^s	^s	[°] ['] ["]	["]	^h ^m
1	11 24 16.22	+0.898	5 51 59.1	-5.20	20 38.2	1	11 32 58.42	+0.829	5 3 36.9	-2.70	18 48.8
2	11 24 37.66	0.898	5 49 55.0	5.14	20 34.7	2	11 33 10.93	0.814	5 2 33.2	2.60	18 45.1
3	11 24 58.86	0.878	5 47 52.6	5.07	30 31.1	3	11 33 23.08	0.499	5 1 31.9	2.50	18 41.3
4	11 25 19.81	0.868	5 45 51.9	5.00	20 27.5	4	11 33 34.87	0.484	5 0 33.0	2.40	18 37.6
5	11 25 40.50	0.857	5 43 52.8	4.93	20 23.9	5	11 33 46.31	0.469	4 59 36.5	2.30	18 33.8
6	11 26 0.94	0.847	5 41 55.4	4.86	20 20.3	6	11 33 57.38	0.454	4 58 42.4	2.20	18 30.1
7	11 26 21.13	0.836	5 39 59.8	4.78	20 16.7	7	11 34 8.08	0.438	4 57 50.8	2.10	18 26.3
8	11 26 41.05	0.825	5 38 6.0	4.70	20 13.1	8	11 34 18.41	0.423	4 57 1.7	2.00	18 22.5
9	11 27 0.71	0.814	5 36 14.1	4.63	20 9.5	9	11 34 28.36	0.407	4 56 15.0	1.89	18 18.8
10	11 27 20.10	0.802	5 34 24.0	4.55	20 5.9	10	11 34 37.94	0.391	4 55 30.8	1.79	18 15.0
11	11 27 39.21	0.791	5 32 35.7	4.47	20 2.3	11	11 34 47.14	0.375	4 54 49.1	1.69	18 11.2
12	11 27 58.05	0.779	5 30 49.3	4.39	19 58.7	12	11 34 55.96	0.360	4 54 9.9	1.58	18 7.4
13	11 28 16.61	0.767	5 29 4.8	4.31	19 55.0	13	11 35 4.40	0.344	4 53 33.2	1.48	18 3.6
14	11 28 34.88	0.755	5 27 22.2	4.23	19 51.4	14	11 35 12.47	0.328	4 52 59.0	1.37	17 59.8
15	11 28 52.87	0.743	5 25 41.6	4.15	19 47.7	15	11 35 20.15	0.312	4 52 27.4	1.26	17 56.0
16	11 29 10.56	0.731	5 24 2.9	4.07	19 44.1	16	11 35 27.44	0.296	4 51 58.3	1.16	17 52.2
17	11 29 27.96	0.719	5 22 26.2	3.99	19 40.4	17	11 35 34.34	0.279	4 51 31.8	1.05	17 48.4
18	11 29 45.06	0.706	5 20 51.6	3.90	19 36.7	18	11 35 40.85	0.263	4 51 7.8	0.95	17 44.5
19	11 30 1.86	0.693	5 19 19.1	3.81	19 33.1	19	11 35 46.97	0.247	4 50 46.4	0.84	17 40.7
20	11 30 18.35	0.681	5 17 48.6	3.73	19 29.4	20	11 35 52.69	0.230	4 50 27.5	0.73	17 36.8
21	11 30 34.53	0.668	5 16 20.2	3.64	19 25.7	21	11 35 58.02	0.214	4 50 11.2	0.62	17 33.0
22	11 30 50.40	0.655	5 14 53.9	3.55	19 22.1	22	11 36 2.95	0.197	4 49 57.6	0.51	17 29.1
23	11 31 5.95	0.641	5 13 29.8	3.46	19 18.4	23	11 36 7.48	0.180	4 49 46.6	0.40	17 25.2
24	11 31 21.18	0.628	5 12 7.8	3.37	19 14.7	24	11 36 11.60	0.163	4 49 38.2	0.30	17 21.4
25	11 31 36.08	0.614	5 10 48.0	3.28	19 11.0	25	11 36 15.32	0.147	4 49 32.4	0.19	17 17.5
26	11 31 50.65	0.600	5 9 30.4	3.19	19 7.3	26	11 36 18.64	0.130	4 49 29.2	-0.08	17 13.6
27	11 32 4.89	0.586	5 8 15.1	3.09	19 3.6	27	11 36 21.55	0.113	4 49 28.7	+0.08	17 9.8
28	11 32 18.79	0.572	5 7 2.1	2.99	18 59.9	28	11 36 24.05	0.096	4 49 30.8	0.14	17 5.9
29	11 32 32.35	0.558	5 5 51.4	2.90	18 56.2	29	11 36 26.14	0.079	4 49 35.5	0.25	17 2.0
30	11 32 45.56	0.543	5 4 43.0	2.80	18 52.5	30	11 36 27.83	0.063	4 49 42.9	0.36	16 58.1
31	11 32 58.42	0.529	5 3 36.9	2.70	18 48.8	31	11 36 29.11	0.046	4 49 52.9	0.47	16 54.2
32	11 33 10.93	+0.514	5 2 33.2	-2.60	18 45.1	32	11 36 29.98	+0.028	4 50 5.5	+0.38	16 50.3
Day of the Month,						Day of the Month,					
		1st.	11th.	21st.	31st.			1st.	11th.	21st.	31st.
Polar Semidiameter		7.8	7.9	8.0	8.2	Polar Semidiameter		8.2	8.3	8.5	8.6
Horizontal Parallax		0.9	0.9	0.9	0.9	Horizontal Parallax		0.9	0.9	0.9	0.9

242 SUN'S COÖRDINATES, 1861.

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.
Jan.	1	d			Mar.	1	d		
	2	1	+1900099	—8849469		2	60	+9371183	—2970609
	3	2	.2071426	.8817163		3	61	.9428836	.2820552
	4	3	.2242125	.8782115		4	62	.9483637	.2669628
	5	4	.2412140	.8744331		5	63	.9535569	.2517883
	6	5	.2581417	.8703821		6	64	.9584616	.2365362
	7	6	+2749905	—8660594		7	65	+9630763	—2212111
	8	7	.2917549	.8614662		8	66	.9673994	.2058176
	9	8	.3084292	.8566036		9	67	.9714296	.1903605
	10	9	.3250081	.8514731		10	68	.9751656	.1748445
	11	10	.3414862	.8460762		11	69	.9786060	.1592748
	12	11	+3578579	—8404147		12	70	+9817498	—1436569
	13	12	.3741177	.8344904		13	71	.9845964	.1279957
	14	13	.3902602	.8283053		14	72	.9871452	.1122961
	15	14	.4062801	.8218616		15	73	.9893957	.0965629
	16	15	.4221723	.8151616		16	74	.9913474	.0808012
	17	16	+4379317	—8082075		17	75	+9930001	—0650160
	18	17	.4535534	.8010021		18	76	.9943540	.0492125
	19	18	.4690324	.7935481		19	77	.9954095	.0333957
	20	19	.4843642	.7858483		20	78	.9961667	.0175704
	21	20	.4995443	.7779054		21	79	.9966259	—0017412
	22	21	+5145683	—7697223		22	80	+9967879	+0140871
	23	22	.5294321	.7613018		23	81	.9966531	.0299099
	24	23	.5441313	.7526466		24	82	.9962219	.0457228
	25	24	.5586614	.7437593		25	83	.9954950	.0615212
	26	25	.5730185	.7346437		26	84	.9944729	.0773008
	27	26	+5871991	—7252997		27	85	+9931564	+0930572
	28	27	.6011990	.7157333		28	86	.9915462	.1087860
	29	28	.6150139	.7059463		29	87	.9896431	.1244827
	30	29	.6286398	.6959415		30	88	.9874477	.1401431
	31	30	.6420728	.6857217		31	89	.9849605	.1557631
	1	31	+6553068	—6752898		1	90	+9821822	+1713383
	2	32	.6683437	.6646487		2	91	.9891134	.1868642
	3	33	.6811735	.6538015		3	92	.9757549	.2023363
	4	34	.6937943	.6427512		4	93	.9721076	.2177500
	5	35	.7062021	.6315013		5	94	.9681726	.2331009
	6	36	+7183927	—6200555		6	95	+9639510	+2483843
	7	37	.7303620	.6084174		7	96	.9594441	.2635954
	8	38	.7421060	.5965903		8	97	.9546533	.2787294
	9	39	.7536208	.5845778		9	98	.9495799	.2937817
	10	40	.7649024	.5723839		10	99	.9442253	.3087477
	11	41	+7759476	—5600127		11	100	+9385919	+3236230
	12	42	.7867534	.5474686		12	101	.9326815	.3384028
	13	43	.7973159	.5347558		13	102	.9264961	.3530824
	14	44	.8076316	.5218786		14	103	.9200382	.3676575
	15	45	.8176974	.5088413		15	104	.9133104	.3821235
	16	46	+8275110	—4956484		16	105	+9063151	+3964760
	17	47	.8370699	.4823042		17	106	.8990549	.4107110
	18	48	.8463715	.4688132		18	107	.8915326	.4248247
	19	49	.8554130	.4551799		19	108	.8837507	.4388131
	20	50	.8641919	.4414087		20	109	.8757120	.4526725
	21	51	+8727061	—4275041		21	110	+8674194	+4663992
	22	52	.8809540	.4134706		22	111	.8588759	.4799897
	23	53	.8889335	.3993123		23	112	.8500841	.4934403
	24	54	.8966426	.3850333		24	113	.8410467	.5067474
	25	55	.9040794	.3706379		25	114	.8317666	.5199077
	26	56	+9112425	—3561803		26	115	+8222464	+5329177
	27	57	.9181298	.3415145		27	116	.8124889	.5457741
	28	58	.9247395	.3267948		28	117	.8024969	.5584736
	29	59	.9310696	.3119755		29	118	.7923733	.5710127
	30	60	.9371183	.2970609		30	119	.7818209	.5833883
	31	61	+9428836	—2820552		31	120	+7711424	+5955968

SUN'S COÖRDINATES, 1861. 243

Greenwich Mean Noon.			X.	Y.	Z.	Greenwich Mean Noon.			X.	Y	Z.
May	1	121	+7602404	+6076344	+2636780	July	1	182	—1687875	+9198020	+3991374
	2	122	.7491179	.6194977	.2688267		2	183	.1854491	.9171060	.3979672
	3	123	.7377783	.6311835	.2738982		3	184	.2020599	.9141510	.3966844
	4	124	.7262246	.6426882	.2788909		4	185	.2186149	.9109374	.3952894
	5	125	.7144602	.6540083	.2838034		5	186	.2351091	.9074661	.3937825
	6	126	+7024887	+6651405	+2886341		6	187	—2515375	+9037378	+3921639
	7	127	.6903136	.6760813	.2933816		7	188	.2678952	.8997535	.3904342
	8	128	.6779386	.6868273	.2980444		8	189	.2841771	.8955144	.3885941
	9	129	.6653675	.6973753	.3026212		9	190	.3003782	.8910217	.3866441
	10	130	.6526041	.7077220	.3071106		10	191	.3164935	.8862769	.3845847
	11	131	+6896528	+7178644	+3115112		11	192	—3325182	+8812815	+3824167
	12	132	.6265176	.7277997	.3158218		12	193	.3484478	.8760373	.3801409
	13	133	.6132027	.7375251	.3200413		13	194	.3642778	.8705461	.3777581
	14	134	.5997127	.7470377	.3241685		14	195	.3800039	.8648096	.3752689
	15	135	.5860518	.7563352	.3282023		15	196	.3956214	.8588296	.3726739
	16	136	+5722243	+7654151	+3321417		16	197	—4111259	+8526079	+3699741
	17	137	.5582343	.7742753	.3359857		17	198	.4265132	.8461467	.3671706
	18	138	.5440863	.7829137	.3397336		18	199	.4417791	.8394480	.3642642
	19	139	.5297848	.7913281	.3433845		19	200	.4569196	.8325139	.3612559
	20	140	.5153337	.7995168	.3469377		20	201	.4719309	.8253465	.3581465
	21	141	+5007370	+8074780	+3503923		21	202	—4868096	+8179478	+3549366
	22	142	.4859992	.8152098	.3537475		22	203	.5015515	.8103197	.3516271
	23	143	.4711245	.8227103	.3570024		23	204	.5161525	.8024638	.3482189
	24	144	.4561168	.8309975	.3601563		24	205	.5306089	.7943824	.3447127
	25	145	.4409900	.8370098	.3632084		25	206	.5449168	.7860776	.3411095
	26	146	+4257179	+8438057	+3661580		26	207	—5590720	+7775514	+3374101
	27	147	.4103345	.8503634	.3690043		27	208	.5730706	.7688059	.3336153
	28	148	.3948342	.8566810	.3717464		28	209	.5869087	.7598430	.3297260
	29	149	.3792214	.8627567	.3743835		29	210	.6005823	.7506647	.3257430
	30	150	.3635002	.8685888	.3769148		30	211	.6140873	.7412730	.3216673
June	31	151	+3476746	+8741755	+3793394	Aug.	31	212	—6274199	+7316704	+3175000
	1	152	.3317487	.8795148	.3816566		1	213	.6405758	.7218594	.3132422
	2	153	.3157271	.8846051	.3838657		2	214	.6535506	.7118426	.3088949
	3	154	.2996144	.8894449	.3859659		3	215	.6663403	.7016827	.3044594
	4	155	.2834153	.8940327	.3879565		4	216	.6789408	.6912025	.2999369
	5	156	+2671347	+8963667	+3898368		5	217	—6913480	+6805847	+2953288
	6	157	.2507773	.9024454	.3916062		6	218	.7035579	.6697724	.2906365
	7	158	.2343482	.9062675	.3932641		7	219	.7155668	.6587690	.2858613
	8	159	.2178523	.9098520	.3948102		8	220	.7273712	.6475776	.2810047
	9	160	.2012946	.9131379	.3962440		9	221	.7389674	.6362015	.2760682
	10	161	+1846801	+9161843	+3975652		10	222	—7508519	+6246445	+2710531
	11	162	.1680139	.9189704	.3987734		11	223	.7615213	.6129100	.2659611
	12	163	.1513008	.9214957	.3998684		12	224	.7724723	.6010016	.2607939
	13	164	.1345460	.9237596	.4008502		13	225	.7832021	.5889230	.2555529
	14	165	.1177546	.9257621	.4017186		14	226	.7937077	.5766777	.2502397
	15	166	+1009316	+9275029	+4024736		15	227	—8039864	+5642693	+2448558
	16	167	.0840818	.9289820	.4031152		16	228	.8140353	.5517012	.2394027
	17	168	.0673099	.9301991	.4036434		17	229	.8238517	.5389770	.2336820
	18	169	.0503306	.9311842	.4040581		18	230	.8334332	.5261002	.2282951
	19	170	.0334183	.9318476	.4043593		19	231	.8427773	.5130745	.2226435
	20	171	+0165076	+9322795	+4045470		20	232	—8518814	+4999035	+2169287
	21	172	—0004069	.9324499	.4046213		21	233	.8607430	.4865907	.2111522
	22	173	.0173307	.9323590	.4045823		22	234	.8693597	.4731391	.2053153
	23	174	.0342294	.9320068	.4044300		23	235	.8777290	.4595522	.1994196
	24	175	.0511289	.9313985	.4041644		24	236	.8858484	.4458336	.1934668
	25	176	—0680147	+9305192	+4037857		25	237	—8937152	+4319869	+1874582
	26	177	.0848822	.9293841	.4032939		26	238	.9013268	.4180154	.1813952
	27	178	.1017970	.9279883	.4026889		27	239	.9086807	.4039228	.1752795
	28	179	.1185447	.9263320	.4019707		28	240	.9157744	.3897131	.1691127
	29	180	.1353306	.9244153	.4011393		29	241	.9226054	.3753902	.1628965
30	181	.1520797	.9222385	.4001948	30	242	.9291711	.3609578	.1566529		
31	182	—1687875	+9198020	+3991374	31	243	—9354689	+3464198	+1503237		

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Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.
Sept. 1	d				Nov. 1	d			
	244	—9414965	+3317805	+1439707		305	—7698643	—5735956	—2489039
	2 245	.9472517	.3170443	.1375757		2 306	.7586140	.5857172	.2541634
	3 246	.9527324	.3022156	.1311405		3 307	.7471321	.5976602	.2593453
	4 247	.9579366	.2872986	.1246670		4 308	.7354221	.6094206	.2644479
	5 248	.9628626	.2722979	.1181573		5 309	.7234878	.6209943	.2694695
	6 249	—9675087	+2572182	+1116135		6 310	—7113331	—6323775	—2744083
	7 250	.9718729	.2420640	.1050376		7 311	.6989617	.6435667	.2792627
	8 251	.9759537	.2268400	.0984316		8 312	.6863776	.6545585	.2840314
	9 252	.9797498	.2115510	.0917976		9 313	.6735850	.6653492	.2887130
	10 253	.9832604	.1962017	.0851376		10 314	.6605880	.6759355	.2933062
	11 254	—9864847	+1807967	+0784535		11 315	—6473905	—6863143	—2978095
	12 255	.9894290	.1653405	.0717472		12 316	.6339966	.6964828	.3022217
	13 256	.9920713	.1498377	.0650205		13 317	.6204104	.7064381	.3065414
	14 257	.9944318	.1342925	.0583754		14 318	.6066360	.7161772	.3107674
	15 258	.9965031	.1187095	.0515140		15 319	.5926775	.7256973	.3148986
16 259	—9982847	+1030932	+0447382	16 320	—5785389	—7349957	—3189337		
17 260	.9997761	.0874480	.0379497	17 321	.5642241	.7440698	.3228716		
18 261	1.0009770	.0717782	.0311503	18 322	.5497372	.7529169	.3267111		
19 262	1.0018870	.0560878	.0243419	19 323	.5350819	.7615342	.3304511		
20 263	1.0025054	.0403810	.0175262	20 324	.5202622	.7699189	.3340901		
21 264	—1.0028316	+0246624	+0107052	21 325	—5052827	—7780683	—3376269		
22 265	1.0028653	+0089362	+0038807	22 326	.4901475	.7859800	.3410604		
23 266	1.0026059	—0067936	—0029454	23 327	.4748608	.7936513	.3443896		
24 267	1.0020533	.0225227	.0097711	24 328	.4594267	.8010795	.3476132		
25 268	1.0012072	.0382463	.0165946	25 329	.4438496	.8082618	.3507300		
26 269	—1.0000671	—0539599	—0234141	26 330	—4281343	—8161954	—3537388		
27 270	.9986327	.0696591	.0302274	27 331	.4122856	.8218780	.3566385		
28 271	.9969040	.0853393	.0370323	28 332	.3963081	.8283070	.3594280		
29 272	.9948807	.1009958	.0438268	29 333	.3802065	.8344799	.3621063		
30 273	.9925628	.1166237	.0506089	30 334	.3639857	.8403942	.3646723		
Oct. 1	274	—9899504	—1322182	—0573763	Dec. 1	335	—3476512	—8460478	—3671250
	2 275	.9870440	.1477743	.0641269		2 336	.3312085	.8514386	.3694636
	3 276	.9838439	.1632872	.0708586		3 337	.3146630	.8565646	.3716872
	4 277	.9803508	.1787518	.0775692		4 338	.2980201	.8614240	.3737950
	5 278	.9765655	.1941631	.0842565		5 339	.2812852	.8660155	.3757865
	6 279	—9724890	—2095162	—0909184		6 340	—2644639	—8703377	—3776613
	7 280	.9681224	.2248061	.0975527		7 341	.2475617	.8743892	.3794187
	8 281	.9634672	.2400279	.1041574		8 342	.2305840	.8781687	.3810582
	9 282	.9585249	.2551770	.1107304		9 343	.2135363	.8816750	.3825793
	10 283	.9532973	.2702488	.1172698		10 344	.1964239	.8849072	.3839817
	11 284	—9477859	—2852386	—1237736		11 345	—1792520	—8878647	—3852651
	12 285	.9419924	.3001417	.1302899		12 346	.1620261	.8905469	.3864292
	13 286	.9359187	.3149538	.1366669		13 347	.1447515	.8929534	.3874737
	14 287	.9295666	.3296709	.1430527		14 348	.1274335	.8950835	.3883984
	15 288	.9229377	.3442888	.1493955		15 349	.1100769	.8969368	.3892031
	16 289	—9160340	—3588033	—1556936		16 350	—0926869	—8985128	—3898876
17 290	.9088576	.3732098	.1619453	17 351	.0752683	.8998111	.3904515		
18 291	.9014104	.3875041	.1681487	18 352	.0578262	.9008312	.3908946		
19 292	.8936945	.4016827	.1743018	19 353	.0403657	.9015725	.3912169		
20 293	.8857116	.4157418	.1804027	20 354	.0228920	.9020347	.3914181		
21 294	—8774638	—4296772	—1864497	21 355	—0054101	—9022176	—3914980		
22 295	.8689531	.4434845	.1924413	22 356	+0120750	.9021208	.3914563		
23 296	.8601815	.4571596	.1983758	23 357	.0295579	.9017441	.3912929		
24 297	.8511512	.4706984	.2042513	24 358	.0470331	.9010872	.3910078		
25 298	.8418640	.4840967	.2100660	25 359	.0644950	.9001500	.3906009		
26 299	—8323220	—4973505	—2158179	26 360	+0819383	.8989324	.3900722		
27 300	.8225274	.5104552	.2215050	27 361	.0993575	.8974341	.3894217		
28 301	.8124831	.5234067	.2271255	28 362	.1167472	.8956555	.3886494		
29 302	.8021917	.5362008	.2326775	29 363	.1341016	.8935969	.3877556		
30 303	.7916563	.5488332	.2381591	30 364	.1514149	.8912587	.3867404		
31 304	.7808795	.5612995	.2435685	31 365	.1686814	.8886416	.3856042		
32 305	—7698643	—5735956	—2489039	32 366	+1858954	—8857464	—3843472		

MOON'S LONGITUDE, &c., 1861. 245

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	157° 9' 27.8	-3° 41' 41.2	210° 39' 59.0	-5° 12' 8.1	220° 52' 16.5	-4° 50' 16.5
1.5	164 14 28.5	4 7 53.1	217 45 15.8	5 4 21.7	228 4 22.3	4 35 16.8
2.0	171 20 8.8	4 30 19.5	224 46 55.1	4 52 4.6	235 10 44.7	4 16 11.8
2.5	178 26 10.0	4 48 38.5	231 44 48.7	4 35 34.7	242 11 13.8	3 53 30.6
3.0	185 32 14.5	5 2 32.5	238 38 53.1	4 15 13.3	249 5 48.4	3 27 42.0
3.5	192 38 5.2	5 11 48.8	245 29 8.2	3 51 24.1	255 54 34.9	2 59 16.0
4.0	199 43 25.8	5 16 19.5	252 15 37.2	3 24 32.8	262 37 46.5	2 28 43.2
4.5	206 48 0.2	5 16 1.6	258 58 25.5	2 55 6.6	269 15 41.0	1 56 33.4
5.0	213 51 32.2	5 10 57.3	265 37 39.4	2 23 33.4	275 48 39.6	1 23 15.1
5.5	220 53 45.7	5 1 13.5	272 13 26.2	1 50 21.8	282 17 5.3	0 49 15.9
6.0	227 54 24.6	4 47 1.7	278 45 53.6	1 16 0.4	288 41 22.2	-0 15 2.6
6.5	234 53 12.5	4 28 38.0	285 15 8.9	0 40 57.7	295 1 54.0	+0 19 0.1
7.0	241 49 52.8	4 6 22.5	291 41 18.9	-0 5 41.7	301 19 3.8	0 52 28.7
7.5	248 44 8.8	3 40 38.7	298 4 29.7	+0 29 20.5	307 33 13.1	1 25 0.8
8.0	255 35 44.3	3 11 53.3	304 24 46.9	1 3 43.1	313 44 41.6	1 56 15.7
8.5	262 24 23.6	2 40 35.5	310 42 15.7	1 37 1.7	319 53 47.0	2 25 54.0
9.0	269 9 51.9	2 7 16.2	316 57 1.2	2 8 53.7	326 0 44.9	2 53 38.0
9.5	275 51 55.7	1 32 27.3	323 9 8.6	2 38 58.3	332 5 48.8	3 19 11.6
10.0	282 30 23.2	0 56 40.9	329 18 43.5	3 6 56.9	338 9 10.5	3 42 20.2
10.5	289 5 5.1	-0 20 28.8	335 25 52.7	3 32 33.2	344 11 0.6	4 2 50.9
11.0	295 35 54.9	+0 15 38.4	341 30 44.4	3 55 33.1	350 11 26.5	4 20 32.7
11.5	302 2 49.0	0 51 12.0	347 33 28.5	4 15 44.7	356 10 43.1	4 35 16.7
12.0	308 25 46.9	1 25 45.3	353 34 16.8	4 32 58.3	2 8 53.4	4 46 55.5
12.5	314 44 51.8	1 58 53.9	359 33 23.5	4 47 6.3	8 6 8.9	4 55 23.6
13.0	321 0 10.7	2 30 16.4	5 31 5.3	4 58 2.8	14 2 40.0	5 0 37.6
13.5	327 11 54.1	2 59 34.0	11 27 41.4	5 5 43.8	19 58 38.6	5 2 35.2
14.0	333 20 16.1	3 26 30.5	17 23 33.6	5 10 6.6	25 54 18.4	5 1 16.2
14.5	339 25 34.7	3 50 52.2	23 19 6.3	5 11 9.8	31 49 55.4	4 56 42.0
15.0	345 28 10.6	4 12 27.6	29 14 46.6	5 8 53.1	37 45 47.9	4 48 54.9
15.5	351 28 27.8	4 31 7.5	35 11 3.9	5 3 17.4	43 42 16.9	4 37 59.0
16.0	357 26 53.3	4 46 44.3	41 8 29.6	4 54 24.3	49 39 46.1	4 23 59.1
16.5	3 23 55.9	4 59 11.9	47 7 37.0	4 42 16.3	55 38 42.0	4 7 1.4
17.0	9 20 6.9	5 8 25.4	53 9 1.1	4 26 57.0	61 39 33.6	3 47 13.2
17.5	15 15 59.2	5 14 21.0	59 13 18.3	4 8 31.0	67 42 52.3	3 24 43.2
18.0	21 12 7.1	5 16 55.5	65 21 4.9	3 47 4.3	73 49 11.6	2 59 41.0
18.5	27 9 5.7	5 16 6.7	71 32 57.2	3 22 44.4	79 59 6.8	2 32 17.9
19.0	33 7 30.6	5 11 53.2	77 49 30.9	2 55 40.6	86 13 14.1	2 2 47.0
19.5	39 7 57.4	5 4 14.4	84 11 19.7	2 26 4.8	92 32 9.9	1 31 23.2
20.0	45 11 1.2	4 53 10.4	90 38 54.7	1 54 11.7	98 56 30.2	0 58 23.9
20.5	51 17 16.2	4 38 42.5	97 12 42.8	1 20 19.2	105 26 49.3	+0 24 9.1
21.0	57 27 14.8	4 20 53.6	103 53 5.8	0 44 48.8	112 3 38.3	-0 10 58.2
21.5	63 41 27.1	3 59 48.3	110 40 18.3	+0 8 6.2	118 47 23.6	0 46 31.6
22.0	70 0 20.2	3 35 33.4	117 34 26.7	-0 29 18.7	125 38 25.1	1 22 1.1
22.5	76 24 17.3	3 8 18.5	124 35 28.1	1 6 51.7	132 36 54.3	1 56 53.6
23.0	82 53 37.1	2 38 16.3	131 43 8.6	1 43 54.9	139 42 51.9	2 30 33.0
23.5	89 28 32.9	2 5 43.4	138 57 2.7	2 19 47.7	146 56 6.3	3 2 20.1
24.0	96 9 11.6	1 31 0.2	146 16 33.5	2 53 47.8	154 16 12.7	3 31 34.8
24.5	102 55 33.4	0 54 31.6	153 40 52.8	3 25 12.5	161 42 31.7	3 57 37.5
25.0	109 47 31.5	+0 16 46.6	161 9 1.7	3 53 21.0	169 14 9.1	4 19 50.1
25.5	116 44 51.5	-0 21 41.7	168 39 53.8	4 17 36.2	176 49 57.6	4 37 38.8
26.0	123 47 11.0	1 0 16.6	176 12 16.8	4 37 26.5	184 28 40.2	4 50 36.2
26.5	130 54 0.2	1 38 18.6	183 44 56.0	4 52 27.0	192 8 52.1	4 58 21.7
27.0	138 4 43.3	2 15 6.8	191 16 37.4	5 2 21.0	199 49 4.1	5 0 44.8
27.5	145 18 38.8	2 50 0.3	198 46 10.8	5 7 0.7	207 27 47.7	4 57 43.9
28.0	152 35 0.8	3 22 19.2	206 12 32.8	5 6 26.5	215 3 39.0	4 49 27.5
28.5	159 53 0.9	3 51 26.4	213 34 49.4	5 0 46.7	222 35 22.8	4 36 12.4
29.0	167 11 49.1	4 16 49.0	220 52 16.5	4 50 16.5	230 1 55.1	4 18 22.9
29.5	174 30 36.8	4 37 59.5	228 4 22.3	4 35 16.8	237 22 24.9	3 56 28.9
30.0	181 48 37.6	4 54 36.5	235 10 44.7	4 16 11.8	244 36 15.9	3 31 3.7
30.5	189 5 8.8	5 6 24.0	242 11 13.8	3 53 30.6	251 43 5.5	3 2 43.2
31.0	196 19 32.9	5 13 16.5	249 5 48.4	3 27 42.0	258 42 44.5	2 32 3.2
31.5	203 31 18.2	-5 15 9.5	255 54 34.9	-2 59 16.0	265 35 15.0	-1 59 39.2

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FOR GREENWICH MEAN NOON AND MIDNIGHT.						
Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	272° 20' 48.9	-1° 26' 4.6	307° 23' 44.9	+1° 51' 51.3	352° 46' 33.1	+4° 50' 42.6
1.5	278 59 46.1	0 51 51.0	313 42 2.7	2 22 21.6	358 45 37.4	5 0 53.3
2.0	285 32 32.2	-0 17 27.3	319 55 36.3	2 50 46.1	4 43 5.7	5 7 45.9
2.5	291 59 36.6	+0 16 39.9	326 5 1.7	3 16 51.3	10 39 30.9	5 11 18.7
3.0	298 21 31.2	0 50 6.6	332 10 54.6	3 40 25.4	16 35 21.7	5 11 31.1
3.5	304 38 49.0	1 22 31.1	338 13 49.8	4 1 18.3	22 31 8.7	5 8 23.3
4.0	310 52 3.0	1 53 33.9	344 14 20.7	4 19 21.3	28 27 17.4	5 1 56.8
4.5	317 1 45.4	2 23 57.2	350 12 58.7	4 34 27.2	34 24 12.0	4 52 13.9
5.0	323 8 26.9	2 50 24.9	356 10 12.7	4 46 29.7	40 22 14.2	4 39 18.5
5.5	329 12 36.2	3 15 42.7	2 6 29.0	4 55 23.7	46 21 43.0	4 23 16.1
6.0	335 14 39.4	3 38 37.6	8 2 11.3	5 1 5.5	52 22 55.5	4 4 13.2
6.5	341 14 59.8	3 58 58.1	13 57 40.8	5 3 32.3	58 26 6.5	3 42 19.2
7.0	347 13 58.4	4 16 33.8	19 53 16.2	5 2 42.7	64 31 28.2	3 17 44.8
7.5	353 11 53.2	4 31 16.0	25 49 13.7	4 58 36.6	70 39 13.2	2 50 42.8
8.0	359 8 59.9	4 42 57.4	31 45 47.8	4 51 15.6	76 49 30.1	2 21 28.5
8.5	5 5 32.4	4 51 31.9	37 43 11.3	4 40 42.5	83 2 26.2	1 50 19.3
9.0	11 1 42.6	4 56 55.2	43 41 35.4	4 27 2.3	89 18 9.4	1 17 34.7
9.5	16 57 40.7	4 59 4.2	49 41 10.4	4 10 21.4	95 36 46.0	0 43 36.4
10.0	22 53 38.2	4 57 58.5	55 42 6.3	3 50 48.3	101 58 22.4	+0 8 47.8
10.5	28 49 43.4	4 53 38.2	61 44 33.1	3 28 33.0	108 23 5.0	-0 26 26.1
11.0	34 46 6.8	4 46 5.4	67 48 41.2	3 3 47.8	114 51 0.0	1 1 38.6
11.5	40 42 59.3	4 35 24.1	73 54 41.8	2 36 46.2	121 22 14.0	1 36 22.1
12.0	46 40 32.8	4 21 40.0	80 2 47.4	2 7 44.0	127 56 53.7	2 10 8.2
12.5	52 39 0.7	4 4 59.8	86 13 12.0	1 36 58.3	124 35 6.2	2 42 28.0
13.0	58 38 39.0	3 45 32.3	92 26 11.5	1 4 48.0	141 16 57.4	3 12 52.6
13.5	64 39 45.8	3 23 27.3	98 42 3.3	+0 31 33.5	148 2 32.6	3 40 53.4
14.0	70 42 41.7	2 58 56.1	105 1 6.5	-0 2 23.5	154 51 55.7	4 6 2.6
14.5	76 47 49.8	2 32 11.8	111 23 41.9	0 36 39.7	161 45 9.8	4 27 53.5
15.0	82 55 35.7	2 3 28.4	117 50 11.2	1 10 50.5	168 42 11.3	4 46 1.4
15.5	89 6 27.3	1 33 1.4	124 20 56.5	1 44 29.9	175 42 59.0	5 0 3.8
16.0	95 20 54.6	1 1 8.2	130 56 19.4	2 17 10.7	182 47 23.9	5 9 41.3
16.5	101 39 29.1	+0 28 7.7	137 36 40.3	2 48 24.7	189 55 13.2	5 14 38.2
17.0	108 2 42.7	-0 5 39.5	144 22 17.2	3 17 42.7	197 6 8.5	5 14 43.3
17.5	114 31 7.3	0 39 50.4	151 13 24.9	3 44 35.0	204 19 45.3	5 9 50.4
18.0	121 5 13.6	1 13 59.8	158 10 12.6	4 8 31.6	211 35 34.1	4 59 59.4
18.5	127 45 30.0	1 47 40.3	165 12 43.2	4 29 3.4	218 53 0.0	4 45 16.2
19.0	134 32 20.6	2 20 22.2	172 20 51.6	4 45 42.1	226 11 23.0	4 25 53.1
19.5	141 26 3.9	2 51 34.2	179 34 23.3	4 58 2.1	233 20 59.5	4 2 9.3
20.0	148 26 50.3	3 20 42.4	186 52 53.7	5 5 41.3	240 48 3.1	3 34 29.7
20.5	155 34 40.2	3 47 11.5	194 15 47.2	5 8 22.4	248 4 46.2	3 3 25.7
21.0	162 49 22.3	4 10 27.2	201 42 18.0	5 5 54.2	255 19 21.7	2 29 32.0
21.5	170 10 32.0	4 29 55.3	209 11 30.5	4 58 12.9	262 31 4.8	1 53 27.4
22.0	177 37 31.0	4 45 4.4	216 42 21.5	4 45 22.2	269 39 14.1	1 15 52.6
22.5	185 9 27.0	4 55 28.9	224 13 42.3	4 27 34.2	276 43 12.9	-0 37 28.5
23.0	192 45 14.3	5 0 45.6	231 44 21.5	4 5 9.6	283 42 30.9	+0 1 5.2
23.5	200 23 37.1	5 0 42.4	239 13 8.0	3 38 36.6	290 36 43.9	0 39 11.1
24.0	208 3 12.0	4 55 16.4	246 38 54.3	3 8 29.6	297 26 34.8	1 16 15.1
24.5	215 42 31.4	4 44 32.6	254 0 39.3	2 35 27.5	304 8 53.8	1 51 45.1
25.0	223 20 9.0	4 28 45.7	261 17 29.9	2 0 12.0	310 46 37.9	2 25 14.8
25.5	230 54 42.3	4 8 19.3	268 28 43.1	1 23 25.6	317 18 51.0	2 56 21.9
26.0	238 24 56.6	3 43 44.2	275 33 46.5	0 45 50.2	323 45 42.6	3 24 48.1
26.5	245 49 48.4	3 15 36.6	282 32 18.9	-0 8 5.3	330 7 28.1	3 50 18.8
27.0	253 8 27.1	2 44 35.8	289 24 9.7	+0 29 12.9	336 24 27.6	4 12 42.9
27.5	260 20 16.1	2 11 22.4	296 9 17.9	1 5 31.8	343 37 4.7	4 31 52.3
28.0	267 24 52.5	1 36 36.8	302 47 51.5	1 40 23.0	348 45 45.9	4 47 41.3
28.5	274 22 6.3	1 0 57.3	309 20 5.5	2 13 22.6	354 51 2.8	5 0 6.2
29.0	281 11 59.3	-0 25 0.2	315 46 21.5	2 44 10.3	0 53 26.9	5 9 5.3
29.5	287 54 43.0	+0 10 42.4	322 7 5.9	3 12 29.7	6 53 30.5	5 14 38.0
30.0	294 30 37.1	0 45 41.4	328 22 48.4	3 38 7.6	12 51 47.5	5 16 44.7
30.5	301 0 7.6	1 19 31.6	334 34 1.7	4 0 53.2	18 48 52.5	5 15 26.8
31.0	307 23 44.9	1 51 51.3	340 41 20.2	4 20 38.3	24 45 19.9	5 10 46.5
31.5	313 42 2.7	+2 22 21.6	346 45 18.9	+4 37 16.4	30 41 43.2	+5 2 46.9

MOON'S LONGITUDE, &c., 1861. 247

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	24° 45' 19.9	+5° 10' 46.5	68° 38' 47.6	+2° 59' 14.7	114° 30' 57.0	-1° 6' 10.3
1.5	30 41 43.2	5 2 46.9	74 46 45.9	2 30 36.2	121 11 0.9	1 40 28.2
2.0	36 38 34.8	4 51 31.6	80 58 33.6	1 59 54.8	127 57 39.6	2 13 52.4
2.5	42 36 26.3	4 37 5.8	87 14 36.9	1 27 26.9	134 50 52.7	2 45 49.5
3.0	48 35 47.3	4 19 35.2	93 35 18.1	0 53 31.7	141 50 20.6	3 15 44.7
3.5	54 37 5.2	3 59 7.1	100 0 55.2	+0 18 31.2	148 56 9.3	3 43 2.5
4.0	60 40 45.5	3 35 50.4	106 31 40.8	-0 17 10.0	156 7 19.7	4 7 8.3
4.5	66 47 10.8	3 9 55.8	113 7 41.8	0 53 4.2	163 23 18.8	4 27 29.5
5.0	72 56 40.9	2 41 36.0	119 48 58.9	1 28 41.3	170 43 15.4	4 43 37.2
5.5	79 9 32.8	2 11 6.3	126 35 26.3	2 3 28.9	178 6 11.1	4 55 7.7
6.0	85 26 0.0	1 38 44.1	133 26 51.2	2 36 53.0	185 31 2.6	5 1 43.7
6.5	91 46 12.8	1 4 49.6	140 22 54.4	3 8 19.2	192 56 44.1	5 3 15.3
7.0	98 10 18.1	+0 29 45.6	147 23 10.1	3 37 13.2	200 22 10.9	4 59 40.3
7.5	104 38 19.4	-0 6 2.7	154 27 7.3	4 3 2.3	207 46 21.8	4 51 4.4
8.0	111 10 16.9	0 42 7.7	161 34 10.3	4 26 16.1	215 8 21.4	4 37 40.4
8.5	117 46 7.8	1 18 0.1	168 43 40.1	4 43 28.3	222 27 22.3	4 19 47.7
9.0	124 25 46.3	1 53 9.0	175 54 56.0	4 57 16.9	229 42 46.2	3 57 50.9
9.5	131 9 4.2	2 27 2.7	183 7 16.9	5 6 25.5	236 54 4.2	3 32 18.7
10.0	137 55 50.9	2 59 9.4	190 20 3.0	5 10 43.8	244 0 56.9	3 3 42.4
10.5	144 45 53.8	3 28 57.8	197 32 36.7	5 10 7.5	251 3 13.8	2 32 35.3
11.0	151 38 58.9	3 55 57.8	204 44 24.2	5 4 38.1	258 0 51.7	1 59 30.9
11.5	158 34 51.0	4 19 41.4	211 54 55.6	4 54 23.1	264 53 53.9	1 25 2.9
12.0	165 33 13.7	4 39 43.9	219 3 45.8	4 39 35.5	271 42 28.2	0 49 44.1
12.5	172 33 50.2	4 55 41.0	226 10 34.4	4 20 33.1	278 26 46.3	-0 14 6.0
13.0	179 36 22.9	5 7 16.7	233 15 5.6	3 57 37.4	285 7 1.8	+0 21 21.2
13.5	186 40 34.0	5 14 16.2	240 17 7.5	3 31 13.8	291 43 29.3	0 56 9.4
14.0	193 46 5.5	5 16 30.2	247 16 32.0	3 1 50.1	298 16 23.7	1 29 52.1
14.5	200 52 38.7	5 13 54.3	254 13 13.5	2 29 56.3	304 45 50.0	2 2 5.0
15.0	207 59 54.9	5 6 29.2	261 7 8.7	1 56 3.9	311 12 28.1	2 32 26.0
15.5	215 7 34.7	4 54 20.7	267 58 15.6	1 20 45.4	317 36 2.5	3 0 35.1
16.0	222 15 18.5	4 37 39.8	274 46 32.8	0 44 33.5	323 56 51.8	3 26 14.7
16.5	229 22 45.9	4 16 42.4	281 31 59.3	-0 8 0.5	330 15 4.1	3 49 9.5
17.0	236 29 36.1	3 51 49.4	288 14 33.8	+0 28 21.8	336 30 45.9	4 9 6.6
17.5	243 35 27.5	3 23 25.8	294 54 14.5	1 4 2.7	342 44 2.8	4 25 55.6
18.0	250 39 58.3	2 52 0.6	301 30 58.7	1 38 33.5	348 54 57.5	4 39 28.7
18.5	257 42 46.0	2 18 5.9	308 4 43.4	2 11 27.4	355 3 36.2	4 49 40.3
19.0	264 43 28.2	1 42 16.1	314 35 25.1	2 42 20.0	1 10 2.5	4 56 27.4
19.5	271 41 42.7	1 5 7.5	321 3 0.4	3 10 50.0	7 14 21.5	4 59 49.2
20.0	278 37 7.7	-0 27 16.7	327 27 26.5	3 36 38.6	13 16 40.1	4 59 47.0
20.5	285 29 23.0	+0 10 39.9	333 48 41.4	3 59 30.6	19 17 6.8	4 56 24.1
21.0	292 18 9.7	0 48 7.2	340 6 44.8	4 19 13.6	25 15 52.3	4 49 45.6
21.5	299 3 11.0	1 24 32.0	346 21 38.0	4 35 38.3	31 13 9.8	4 39 57.9
22.0	306 44 12.9	1 59 23.9	352 33 25.3	4 48 38.4	37 9 15.7	4 27 9.0
22.5	312 21 4.8	2 32 16.1	358 42 13.7	4 58 10.4	43 4 29.2	4 11 27.8
23.0	318 53 40.0	3 2 45.0	4 48 13.3	5 4 13.0	48 59 12.6	3 53 4.3
23.5	325 21 55.7	3 30 31.1	10 51 37.2	5 6 47.2	54 53 51.2	3 32 9.2
24.0	331 45 53.5	3 55 18.4	16 52 42.1	5 5 55.8	60 48 53.9	3 8 54.1
24.5	338 5 38.8	4 16 54.8	22 51 47.8	5 1 42.9	66 44 52.0	2 43 31.1
25.0	344 21 21.7	4 35 11.2	28 49 17.6	4 54 14.0	72 42 19.8	2 16 13.2
25.5	350 33 16.2	4 50 1.6	34 45 37.7	4 43 35.8	78 41 53.8	1 47 14.2
26.0	356 41 40.2	5 1 22.7	40 41 17.0	4 29 55.6	84 44 12.3	1 16 48.8
26.5	2 46 54.9	5 9 13.1	46 36 47.3	4 13 21.5	90 49 54.9	0 45 13.1
27.0	8 49 24.8	5 13 33.2	52 32 42.7	3 54 2.2	96 59 41.9	+0 12 44.4
27.5	14 49 37.4	5 14 25.2	58 29 39.3	3 32 7.4	103 14 13.2	-0 20 18.0
28.0	20 48 2.7	5 11 52.2	64 28 14.5	3 7 47.3	109 34 7.1	0 53 33.3
28.5	26 45 12.6	5 5 58.0	70 29 6.8	2 41 13.2	115 59 59.7	1 26 38.1
29.0	32 41 40.7	4 56 47.8	76 32 55.0	2 12 37.5	122 32 23.2	1 59 6.7
29.5	38 38 1.9	4 44 26.9	82 40 17.4	1 42 14.1	129 11 44.4	2 30 31.2
30.0	44 34 51.7	4 29 1.6	88 51 51.5	1 10 18.7	135 58 22.5	3 0 21.2
30.5	50 32 46.0	4 10 39.2	95 8 12.3	0 37 9.1	142 52 28.3	3 28 4.6
31.0	56 32 20.4	3 49 27.6	101 29 52.3	+0 3 5.4	149 54 1.5	3 53 7.9
31.5	62 34 9.7	+3 25 35.9	107 57 19.6	-0 31 29.6	157 2 49.6	-4 14 57.6

248 MOON'S LONGITUDE, &c., 1861.

FOR GREENWICH MEAN NOON AND MIDNIGHT.						
Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	149° 54' 15"	—3° 53' 7.9"	202° 21' 8.9"	—4° 52' 41.4"	240° 56' 16.1"	—2° 53' 42.2"
1.5	157 2 49.6	4 14 57.6	209 59 13.2	4 38 41.7	248 30 14.3	2 17 40.0
2.0	164 18 26.9	4 33 1.0	217 38 52.6	4 19 38.3	256 1 57.4	1 39 22.1
2.5	171 40 14.3	4 46 48.1	225 18 40.7	3 55 52.9	263 30 17.8	0 59 36.4
3.0	179 7 18.9	4 55 53.4	232 57 11.8	3 27 55.5	270 54 14.7	—0 19 11.4
3.5	186 38 36.5	4 59 57.2	240 33 4.6	2 56 23.4	278 12 57.0	+0 21 6.0
4.0	194 12 53.2	4 58 47.6	248 5 5.5	2 21 59.0	285 25 44.0	1 0 32.0
4.5	201 48 48.6	4 52 21.1	255 32 11.7	1 45 27.5	292 32 6.1	1 38 27.8
5.0	209 24 59.9	4 40 43.4	262 53 32.7	1 7 34.9	299 31 44.8	2 14 19.2
5.5	217 0 5.5	4 24 9.4	270 8 31.1	—0 29 6.0	306 24 32.1	2 47 38.2
6.0	224 32 48.5	4 3 1.9	277 16 42.9	+0 9 17.3	313 10 29.5	3 18 2.7
6.5	232 2 0.9	3 37 50.7	284 17 56.4	0 46 56.8	319 49 46.9	3 45 15.3
7.0	239 26 44.9	3 9 10.7	291 12 11.1	1 23 18.9	326 22 41.5	4 9 3.9
7.5	246 46 15.3	2 37 40.2	297 59 35.9	1 57 54.8	332 49 35.6	4 29 20.1
8.0	253 59 59.6	2 3 59.0	304 40 27.1	2 30 20.3	339 10 56.4	4 45 58.9
8.5	261 7 38.0	1 28 46.6	311 15 7.1	3 0 15.5	345 27 13.7	4 58 58.2
9.0	268 9 2.3	0 52 41.7	317 44 2.2	3 27 24.5	351 38 59.6	5 8 17.9
9.5	275 4 14.0	—0 16 20.0	324 7 41.5	3 51 34.5	357 46 47.4	5 13 59.8
10.0	281 53 23.1	+0 19 45.1	330 26 35.2	4 12 35.7	3 51 10.7	5 16 6.8
10.5	288 36 45.6	0 55 3.5	336 41 14.3	4 30 20.9	9 52 42.7	5 14 43.4
11.0	295 14 42.1	1 29 8.2	342 52 9.1	4 44 45.1	15 51 56.1	5 9 54.4
11.5	301 47 36.0	2 1 35.3	348 59 48.9	4 55 44.7	21 49 22.4	5 1 46.0
12.0	308 15 52.2	2 32 4.0	355 4 41.6	5 3 18.0	27 45 31.6	4 50 24.9
12.5	314 39 56.0	3 0 16.0	1 7 13.4	5 7 24.9	33 40 51.9	4 35 58.9
13.0	321 0 12.1	3 25 55.6	7 7 48.4	5 8 6.2	39 35 49.8	4 18 36.8
13.5	327 17 3.9	3 48 49.5	13 6 48.5	5 5 24.6	45 30 49.6	3 58 28.3
14.0	333 30 53.3	4 8 46.6	19 4 33.8	4 59 23.7	51 26 13.8	3 35 44.4
14.5	339 42 0.2	4 25 37.6	25 1 22.2	4 50 8.5	57 22 22.6	3 10 37.4
15.0	345 50 42.3	4 39 15.6	30 57 30.1	4 37 45.7	63 19 34.5	2 43 21.0
15.5	351 57 15.1	4 49 35.3	36 53 12.1	4 22 23.1	69 18 6.1	2 14 10.4
16.0	358 1 52.3	4 56 33.3	42 48 41.9	4 4 10.0	75 18 12.2	1 43 22.2
16.5	4 4 45.6	5 0 8.3	48 44 12.2	3 43 17.4	81 20 6.4	1 11 14.5
17.0	10 6 5.4	5 0 20.6	54 39 55.4	3 19 57.4	87 24 0.8	0 38 7.2
17.5	16 6 1.2	4 57 12.5	60 36 3.5	2 54 23.6	93 30 6.7	+0 4 21.0
18.0	22 4 41.8	4 50 47.9	66 32 49.3	2 26 50.9	99 38 34.9	—0 29 41.8
18.5	28 2 16.2	4 41 12.6	72 30 26.1	1 57 35.5	105 49 35.6	1 3 38.3
19.0	33 58 53.9	4 28 33.9	78 29 8.3	1 26 54.6	112 3 18.9	1 37 4.6
19.5	39 54 45.1	4 13 0.5	84 29 11.5	0 55 6.5	118 19 55.1	2 9 36.2
20.0	45 50 1.7	3 54 42.7	90 30 53.5	+0 22 30.2	124 39 34.8	2 40 48.5
20.5	51 44 57.4	3 33 51.9	96 34 33.6	—0 10 34.1	131 2 28.8	3 10 16.7
21.0	57 39 48.0	3 10 40.6	102 40 33.2	0 43 46.0	137 28 48.1	3 37 36.5
21.5	63 34 51.9	2 45 22.4	108 49 15.4	1 16 43.9	143 58 43.9	4 2 23.8
22.0	69 30 30.1	2 18 11.6	115 1 5.2	1 49 5.8	150 32 27.3	4 24 15.3
22.5	75 27 6.4	1 49 23.4	121 16 28.9	2 20 29.1	157 10 8.8	4 42 49.0
23.0	81 25 7.5	1 19 13.7	127 35 53.8	2 50 30.4	163 51 58.0	4 57 44.2
23.5	87 25 2.7	0 47 59.4	133 59 47.1	3 18 46.0	170 38 3.0	5 8 41.9
24.0	93 27 24.0	+0 15 57.9	140 28 35.9	3 44 51.3	177 28 29.9	5 15 25.4
24.5	99 32 45.5	—0 16 32.2	147 2 45.9	4 8 21.7	184 23 21.6	5 17 40.6
25.0	105 41 43.0	0 49 11.4	153 42 40.0	4 28 52.1	191 22 37.8	5 15 17.1
25.5	111 54 53.2	1 21 38.9	160 28 37.3	4 45 57.9	198 26 13.1	5 8 8.1
26.0	118 12 53.3	1 53 32.6	167 20 51.9	4 59 14.9	205 33 57.1	4 56 11.6
26.5	124 36 19.6	2 24 28.9	174 19 31.2	5 8 20.7	212 45 33.2	4 39 30.8
27.0	131 5 46.5	2 54 2.5	181 24 34.1	5 12 55.0	220 0 38.4	4 18 15.0
27.5	137 41 45.1	3 21 46.8	188 35 50.0	5 12 40.7	227 18 42.8	3 52 39.6
28.0	144 24 41.6	3 47 13.4	195 52 57.6	5 7 25.9	234 39 10.2	3 23 6.8
28.5	151 14 55.7	4 9 53.2	203 15 24.4	4 57 4.0	242 1 18.1	2 50 5.1
29.0	158 12 38.2	4 29 16.6	210 42 26.3	4 41 35.9	249 24 19.3	2 14 8.9
29.5	165 17 49.5	4 44 54.0	218 13 8.9	4 21 10.2	256 47 22.4	1 35 57.7
30.0	172 30 17.8	4 56 17.9	225 46 28.8	3 56 4.3	264 9 34.3	0 56 14.6
30.5	179 49 38.0	5 3 3.5	233 21 15.9	3 26 43.8	271 30 1.0	—0 15 45.0
31.0	187 15 10.7	5 4 50.6	240 56 16.1	2 53 42.2	278 47 50.1	+0 24 45.4
31.5	194 46 2.8	—5 1 25.3	248 30 14.3	—2 17 40.0	286 2 12.4	+1 4 32.2

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

250 OBLIQUITY OF THE ECLIPTIC, &c.

Sidereal O ^h .	Apparent Obliquity.	Equation of Equinoxes.		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Parallax.	
1861.	23° 27'						
0	29.10	+16.16	+0.99	0.00	-20.80	8.72	298° 26.2
10	29.11	16.63	1.02	1.37	20.79	8.72	292 54.5
20	29.18	16.99	1.04	2.74	20.77	8.71	292 22.8
30	29.28	17.21	1.05	4.12	20.75	8.70	291 51.2
40	29.38	17.26	1.06	5.49	20.72	8.69	291 19.5
50	29.47	17.16	1.05	6.86	20.67	8.67	290 43.8
60	29.52	16.93	1.04	8.23	20.62	8.65	290 16.1
70	29.51	16.60	1.02	9.60	20.57	8.63	289 44.4
80	29.44	16.22	0.99	10.98	20.51	8.61	289 12.7
90	29.31	15.86	0.97	12.35	20.45	8.58	288 41.0
100	29.12	15.54	0.95	13.72	20.40	8.56	288 9.3
110	28.88	15.33	0.94	15.09	20.34	8.53	287 37.6
120	28.61	15.23	0.93	16.47	20.29	8.51	287 5.9
130	28.33	15.28	0.94	17.84	20.24	8.49	286 34.3
140	28.07	15.45	0.95	19.21	20.19	8.47	286 2.6
150	27.84	15.74	0.96	20.59	20.16	8.46	285 30.9
160	27.65	16.12	0.99	21.95	20.13	8.45	284 59.2
170	27.51	16.55	1.01	23.33	20.12	8.44	284 27.5
180	27.44	16.98	1.04	24.70	20.11	8.44	283 55.8
190	27.42	17.37	1.06	26.07	20.11	8.44	283 24.1
200	27.45	17.69	1.08	27.44	20.12	8.44	282 52.4
210	27.52	17.89	1.09	28.81	20.14	8.45	282 20.7
220	27.60	17.96	1.10	30.19	20.17	8.46	281 49.0
230	27.68	17.89	1.09	31.56	20.21	8.48	281 17.4
240	27.74	17.70	1.08	32.93	20.25	8.50	280 45.7
250	27.77	17.40	1.07	34.31	20.30	8.52	280 14.0
260	27.74	17.02	1.04	35.68	20.35	8.54	279 42.3
270	27.64	16.61	1.02	37.05	20.41	8.57	279 10.6
280	27.48	16.23	0.99	38.42	20.47	8.59	278 38.9
290	27.27	15.92	0.97	39.79	20.53	8.61	278 7.2
300	27.01	15.72	0.96	41.16	20.59	8.64	277 35.5
310	26.72	15.67	0.96	42.54	20.64	8.66	277 3.8
320	26.44	15.77	0.97	43.91	20.68	8.68	276 32.1
330	26.17	16.03	0.98	45.28	20.73	8.70	276 0.5
340	25.94	16.40	1.01	46.65	20.76	8.71	275 28.8
350	25.77	16.87	1.03	48.02	20.78	8.71	274 57.1
360	25.67	17.36	1.06	49.40	20.79	8.72	274 25.4
370	25.64	+17.81	+1.09	50.77	-20.79	8.72	273 53.7
Mean Obliquity, 1861.0, 23° 27' 25.89 Precession for 1861.5, 50.2550 Log. Precession in a Sidereal Day, 9.13740 Log. Precession in a Solar Day, 9.13859							Daily Motion. 3.169

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Jan. 1	-0.58636	+1.30120	+9.50926	-0.50617	Mar. 1	-1.25046	+0.80859	+9.69832	-0.56820
2	0.62157	1.29950	9.51424	0.50625	2	1.25290	0.78501	9.70018	0.56862
3	0.65403	1.29767	9.51917	0.50640	3	1.25520	0.75993	9.70203	0.56897
4	0.68409	1.29568	9.52399	0.50663	4	1.25736	0.73319	9.70387	0.56925
5	0.71208	1.29354	9.52876	0.50694	5	1.25937	0.70456	9.70568	0.56946
6	-0.73825	+1.29126	+9.53344	-0.50734	6	-1.26123	+0.67379	+9.70747	-0.56960
7	0.76280	1.28883	9.53806	0.50782	7	1.26296	0.64054	9.70924	0.56968
8	0.78590	1.28625	9.54261	0.50838	8	1.26455	0.60442	9.71099	0.56968
9	0.80771	1.28351	9.54709	0.50901	9	1.26600	0.56489	9.71272	0.56961
10	0.82834	1.28061	9.55150	0.50973	10	1.26731	0.52126	9.71443	0.56945
11	-0.84790	+1.27756	+9.55583	-0.51049	11	-1.26849	+0.47266	+9.71614	-0.56921
12	0.86648	1.27435	9.56009	0.51132	12	1.26953	0.41779	9.71782	0.56890
13	0.88416	1.27097	9.56428	0.51222	13	1.27043	0.35488	9.71949	0.56853
14	0.90102	1.26743	9.56841	0.51318	14	1.27120	0.28116	9.72115	0.56808
15	0.91712	1.26373	9.57241	0.51420	15	1.27186	0.19221	9.72279	0.56755
16	-0.93250	+1.25986	+9.57646	-0.51526	16	-1.27237	+0.08015	+9.72442	-0.56694
17	0.94722	1.25581	9.58039	0.51638	17	1.27275	9.92866	9.72606	0.56626
18	0.96133	1.25159	9.58425	0.51753	18	1.27299	9.69399	9.72768	0.56549
19	0.97485	1.24719	9.58804	0.51873	19	1.27311	+9.14667	9.72929	0.56464
20	0.98782	1.24261	9.59175	0.51998	20	1.27310	-9.32995	9.73090	0.56371
21	-1.00029	+1.23784	+9.59541	-0.52127	21	-1.27295	-9.75390	+9.73249	-0.56270
22	1.01227	1.23288	9.59903	0.52259	22	1.27268	9.96410	9.73408	0.56161
23	1.02379	1.22773	9.60258	0.52394	23	1.27228	0.10498	9.73567	0.56043
24	1.03488	1.22238	9.60607	0.52533	24	1.27174	0.21101	9.73725	0.55920
25	1.04556	1.21682	9.60950	0.52674	25	1.27108	0.29602	9.73883	0.55788
26	-1.05585	+1.21106	+9.61286	-0.52817	26	-1.27028	-0.36693	+9.74041	-0.55647
27	1.06576	1.20508	9.61617	0.52961	27	1.26936	0.42773	9.74199	0.55496
28	1.07531	1.19889	9.61942	0.53107	28	1.26831	0.48091	9.74356	0.55338
29	1.08452	1.19247	9.62259	0.53254	29	1.26712	0.52815	9.74515	0.55171
30	1.09340	1.18581	9.62572	0.53403	30	1.26581	0.57060	9.74674	0.54996
31	-1.10197	+1.17891	+9.62881	-0.53551	31	-1.26436	-0.60915	+9.74833	-0.54812
Feb. 1	1.11024	1.17177	9.63184	0.53700	Apr. 1	1.26277	0.64441	9.74991	0.54621
2	1.11822	1.16437	9.63480	0.53849	2	1.26106	0.67689	9.75151	0.54422
3	1.12593	1.15670	9.63772	0.53997	3	1.25921	0.70696	9.75311	0.54215
4	1.13336	1.14876	9.64058	0.54144	4	1.25722	0.73498	9.75470	0.54000
5	-1.14053	+1.14054	+9.64339	-0.54290	5	-1.25510	-0.76114	+9.75629	-0.53777
6	1.14745	1.13202	9.64616	0.54433	6	1.25284	0.78569	9.75790	0.53546
7	1.15412	1.12319	9.64888	0.54576	7	1.25044	0.80879	9.75951	0.53307
8	1.16056	1.11406	9.65154	0.54720	8	1.24790	0.83060	9.76114	0.53060
9	1.16677	1.10458	9.65416	0.54859	9	1.24522	0.85122	9.76277	0.52805
10	-1.17275	+1.09475	+9.65674	-0.54996	10	-1.24239	-0.87079	+9.76442	-0.52542
11	1.17852	1.08457	9.65927	0.55129	11	1.23942	0.88937	9.76606	0.52271
12	1.18408	1.07401	9.66176	0.55261	12	1.23631	0.90706	9.76772	0.51992
13	1.18943	1.06305	9.66420	0.55390	13	1.23304	0.92393	9.76938	0.51705
14	1.19457	1.05168	9.66660	0.55513	14	1.22963	0.94002	9.77104	0.51411
15	-1.19953	+1.03987	+9.66895	-0.55634	15	-1.22606	-0.95542	+9.77272	-0.51109
16	1.20429	1.02759	9.67128	0.55751	16	1.22234	0.97016	9.77441	0.50800
17	1.20886	1.01482	9.67357	0.55865	17	1.21846	0.98428	9.77611	0.50485
18	1.21326	1.00154	9.67582	0.55972	18	1.21448	0.99782	9.77783	0.50164
19	1.21747	0.98771	9.67803	0.56077	19	1.21022	1.01083	9.77956	0.49835
20	-1.22151	+0.97329	+9.68020	-0.56176	20	-1.20586	-1.02333	+9.78129	-0.49499
21	1.22537	0.95825	9.68223	0.56270	21	1.20133	1.03535	9.78304	0.49156
22	1.22907	0.94253	9.68443	0.56358	22	1.19662	1.04691	9.78480	0.48806
23	1.23260	0.92610	9.68650	0.56441	23	1.19174	1.05806	9.78657	0.48448
24	1.23597	0.90889	9.68854	0.56519	24	1.18668	1.06879	9.78834	0.48084
25	-1.23918	+0.89083	+9.69055	-0.56593	25	-1.18143	-1.07913	+9.79013	-0.47715
26	1.24223	0.87187	9.69253	0.56660	26	1.17600	1.08911	9.79194	0.47341
27	1.24512	0.85191	9.69449	0.56719	27	1.17037	1.09874	9.79375	0.46960
28	1.24787	0.83085	9.69642	0.56773	28	1.16455	1.10804	9.79556	0.46575
29	1.25046	0.80859	9.69832	0.56820	29	1.15853	1.11701	9.79740	0.46185
30	-1.25290	+0.78501	+9.70018	-0.56862	30	-1.15229	-1.12567	+9.79924	-0.45788
31	-1.25520	+0.75993	+9.70203	-0.56897	31	-1.14584	-1.13404	+9.80110	-0.45387

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
May 1	-1.14584	-1.13404	+9.80110	-0.45397	July 1	+0.52262	-1.30362	+9.92242	-0.24797
2	1.13918	1.14213	9.80297	0.44982	2	0.56105	1.30225	9.92426	0.24758
3	1.13229	1.14995	9.80485	0.44571	3	0.59607	1.30076	9.92609	0.24733
4	1.12516	1.15750	9.80674	0.44155	4	0.62937	1.29914	9.92790	0.24723
5	1.11778	1.16479	9.80864	0.43734	5	0.65833	1.29740	9.92970	0.24726
6	-1.11015	-1.17184	+9.81055	-0.43310	6	+0.68623	-1.29562	+9.93148	-0.24741
7	1.10227	1.17866	9.81247	0.42883	7	0.71234	1.29352	9.93325	0.24768
8	1.09412	1.18524	9.81439	0.42454	8	0.73696	1.29139	9.93502	0.24807
9	1.08570	1.19160	9.81633	0.42022	9	0.75996	1.28912	9.93676	0.24859
10	1.07699	1.19775	9.81828	0.41587	10	0.78177	1.28673	9.93849	0.24921
11	-1.06797	-1.20369	+9.82023	-0.41150	11	+0.80242	-1.28420	+9.94020	-0.24936
12	1.05864	1.20949	9.82220	0.40710	12	0.82202	1.28153	9.94189	0.25083
13	1.04999	1.21495	9.82418	0.40267	13	0.84066	1.27873	9.94357	0.25183
14	1.03900	1.22029	9.82617	0.39822	14	0.85843	1.27578	9.94523	0.25294
15	1.02665	1.22544	9.82816	0.39377	15	0.87537	1.27269	9.94688	0.25414
16	-1.01792	-1.23041	+9.83016	-0.38931	16	+0.89157	-1.26946	+9.94852	-0.25542
17	1.00681	1.23520	9.83216	0.38484	17	0.90706	1.26609	9.95013	0.25679
18	0.99528	1.23981	9.83417	0.38038	18	0.92191	1.26256	9.95173	0.25826
19	0.98331	1.24425	9.83620	0.37594	19	0.93615	1.25889	9.95331	0.25983
20	0.97089	1.24852	9.83824	0.37151	20	0.94983	1.25506	9.95487	0.26147
21	-0.95799	-1.25282	+9.84028	-0.36708	21	+0.96297	-1.25108	+9.95642	-0.26316
22	0.94457	1.25657	9.84232	0.36266	22	0.97561	1.24694	9.95795	0.26491
23	0.93059	1.26036	9.84435	0.35826	23	0.98778	1.24263	9.95947	0.26673
24	0.91603	1.26399	9.84639	0.35388	24	0.99950	1.23815	9.96097	0.26862
25	0.90085	1.26747	9.84843	0.34953	25	1.01080	1.23351	9.96245	0.27056
26	-0.88500	-1.27081	+9.85049	-0.34522	26	+1.02170	-1.22869	+9.96391	-0.27251
27	0.86842	1.27399	9.85254	0.34096	27	1.03222	1.22370	9.96535	0.27457
28	0.85106	1.27703	9.85460	0.33674	28	1.04237	1.21853	9.96678	0.27664
29	0.83286	1.27993	9.85666	0.33256	29	1.05217	1.21317	9.96819	0.27875
30	0.81375	1.28269	9.85872	0.32842	30	1.06164	1.20761	9.96958	0.28090
31	-0.79362	-1.28531	+9.86078	-0.32434	31	+1.07080	-1.20186	+9.97097	-0.28307
June 1	0.77239	1.28779	9.86284	0.32033	Aug. 1	1.07966	1.19591	9.97233	0.28524
2	0.74994	1.29014	9.86490	0.31639	2	1.08822	1.18975	9.97367	0.28742
3	0.72617	1.29235	9.86695	0.31253	3	1.09650	1.18338	9.97500	0.28961
4	0.70088	1.29443	9.86900	0.30874	4	1.10450	1.17679	9.97632	0.29183
5	-0.67390	-1.29638	+9.87106	-0.30503	5	+1.11224	-1.16997	+9.97762	-0.29406
6	0.64503	1.29820	9.87311	0.30138	6	1.11973	1.16291	9.97889	0.29627
7	0.61396	1.29989	9.87517	0.29782	7	1.12698	1.15561	9.98015	0.29846
8	0.58037	1.30146	9.87722	0.29436	8	1.13399	1.14806	9.98140	0.30065
9	0.54385	1.30290	9.87926	0.29100	9	1.14077	1.14025	9.98263	0.30286
10	-0.50385	-1.30421	+9.88129	-0.28774	10	+1.14733	-1.13217	+9.98384	-0.30501
11	0.45967	1.30540	9.88333	0.28458	11	1.15367	1.12381	9.98504	0.30711
12	0.41034	1.30647	9.88536	0.28153	12	1.15980	1.11516	9.98622	0.30918
13	0.35457	1.30741	9.88738	0.27859	13	1.16573	1.10621	9.98738	0.31122
14	0.29047	1.30822	9.88940	0.27577	14	1.17146	1.09694	9.98854	0.31323
15	-0.21508	-1.30892	+9.89141	-0.27308	15	+1.17699	-1.08734	+9.98967	-0.31519
16	0.12369	1.30950	9.89342	0.27052	16	1.18234	1.07739	9.99079	0.31712
17	0.00767	1.30995	9.89543	0.26808	17	1.18750	1.06709	9.99189	0.31903
18	9.84874	1.31028	9.89741	0.26576	18	1.19248	1.05641	9.99296	0.32087
19	9.59533	1.31049	9.89939	0.26357	19	1.19728	1.04532	9.99406	0.32263
20	-8.91245	-1.31059	+9.90137	-0.26150	20	+1.20192	-1.03381	+9.99512	-0.32436
21	+9.36239	1.31056	9.90334	0.25957	21	1.20639	1.02186	9.99617	0.32602
22	9.73426	1.31041	9.90530	0.25777	22	1.21069	1.00944	9.99720	0.32760
23	9.93154	1.31014	9.90724	0.25612	23	1.21483	0.99632	9.99822	0.32913
24	0.06660	1.30975	9.90918	0.25460	24	1.21881	0.98307	9.99923	0.33069
25	+0.16937	-1.30924	+9.91110	-0.25323	25	+1.22264	-0.96905	+0.00022	-0.33197
26	0.25230	1.30861	9.91301	0.25200	26	1.22630	0.95443	0.00121	0.33327
27	0.32183	1.30786	9.91492	0.25091	27	1.22981	0.93918	0.00219	0.33449
28	0.38164	1.30698	9.91682	0.24996	28	1.23318	0.92322	0.00315	0.33562
29	0.43408	1.30598	9.91870	0.24915	29	1.23641	0.90652	0.00410	0.33666
30	+0.48077	-1.30486	+9.92057	-0.24849	30	+1.23948	-0.88901	+0.00504	-0.33762
31	+0.52232	-1.30362	+9.92242	-0.24797	31	+1.24242	-0.87062	+0.00597	-0.33850

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Sept. 1	+1.24521	-0.85129	+0.00689	-0.33927	Nov. 1	+1.15864	+1.11683	+0.05896	-0.12951
2	1.24786	0.83091	0.00779	0.33995	2	1.15220	1.12580	0.05996	0.12054
3	1.25037	0.80938	0.00869	0.34052	3	1.14552	1.13446	0.06099	0.11136
4	1.25275	0.78659	0.00957	0.34102	4	1.13859	1.12822	0.06202	0.10195
5	1.25499	0.76238	0.01044	0.34139	5	1.13141	1.15089	0.06306	0.09230
6	+1.25710	-0.73661	+0.01131	-0.34169	6	+1.12397	+1.15969	+0.06410	-0.08239
7	1.25907	0.70907	0.01218	0.34183	7	1.11627	1.16622	0.06516	0.07225
8	1.26091	0.67950	0.01304	0.34189	8	1.10828	1.17350	0.06622	0.06190
9	1.26262	0.64763	0.01389	0.34183	9	1.10001	1.18053	0.06730	0.05131
10	1.26419	0.61309	0.01473	0.34169	10	1.09144	1.18732	0.06838	0.04048
11	+1.26564	-0.57539	+0.01557	-0.34141	11	+1.08256	+1.19387	+0.06947	-0.02940
12	1.26696	0.53395	0.01642	0.34104	12	1.07334	1.20020	0.07057	0.01808
13	1.26815	0.48800	0.01725	0.34052	13	1.06378	1.20631	0.07169	0.00651
14	1.26921	0.43642	0.01806	0.33987	14	1.05388	1.21220	0.07281	9.99469
15	1.27014	0.37770	0.01886	0.33913	15	1.04360	1.21788	0.07394	9.98259
16	+1.27095	-0.30958	+0.01967	-0.33824	16	+1.03292	+1.22336	+0.07507	-9.97021
17	1.27163	0.22859	0.02048	0.33722	17	1.02184	1.22864	0.07621	9.95761
18	1.27218	0.12872	0.02128	0.33606	18	1.01032	1.23372	0.07737	9.94478
19	1.27260	0.99853	0.02207	0.33478	19	0.99834	1.23861	0.07853	9.93172
20	1.27290	9.81142	0.02287	0.33339	20	0.98587	1.24332	0.07969	9.91845
21	+1.27307	-9.47500	+0.02367	-0.33185	21	+0.97290	+1.24785	+0.08086	-9.90488
22	1.27312	+8.70831	0.02446	0.33019	22	0.95938	1.25220	0.08204	9.89109
23	1.27304	9.60285	0.02525	0.32840	23	0.94528	1.25637	0.08323	9.87708
24	1.27283	9.47539	0.02604	0.32646	24	0.93057	1.26037	0.08442	9.86273
25	1.27249	0.04156	0.02683	0.32434	25	0.91518	1.26420	0.08562	9.84813
26	+1.27203	+0.16142	+0.02762	-0.32207	26	+0.89908	+1.26786	+0.08682	-9.83321
27	1.27143	0.25520	0.02842	0.31969	27	0.88222	1.27136	0.08803	9.81809
28	1.27071	0.33223	0.02921	0.31714	28	0.86452	1.27470	0.08925	9.80277
29	1.26985	0.39756	0.03000	0.31448	29	0.84592	1.27788	0.09047	9.78725
30	1.26887	0.45425	0.03079	0.31165	30	0.82634	1.28090	0.09170	9.77150
31	+1.26776	+0.50431	+0.03159	-0.30867	31	+0.80569	+1.28377	+0.09293	-9.75572
Oct. 1	1.26776	0.50431	0.03159	0.30867	Dec. 1	0.80569	1.28377	0.09293	9.75572
2	1.26651	0.54909	0.03238	0.30552	2	0.78385	1.28648	0.09416	9.73965
3	1.26513	0.58960	0.03318	0.30224	3	0.76071	1.28904	0.09540	9.72337
4	1.26361	0.62655	0.03399	0.29890	4	0.73613	1.29145	0.09664	9.70697
5	+1.26196	+0.66051	+0.03480	-0.29518	5	+0.70991	+1.29372	+0.09788	-9.69046
6	1.26017	0.69189	0.03561	0.29139	6	0.68186	1.29584	0.09912	9.67376
7	1.25894	0.72105	0.03642	0.28745	7	0.65171	1.29781	0.10036	9.65696
8	1.25618	0.74828	0.03724	0.28337	8	0.61916	1.29963	0.10161	9.64008
9	1.25397	0.77379	0.03806	0.27910	9	0.58382	1.30131	0.10286	9.62315
10	+1.25162	+0.79776	+0.03889	-0.27464	10	+0.54519	+1.30285	+0.10410	-9.60627
11	1.24913	0.82036	0.03973	0.27001	11	0.50263	1.30425	0.10535	9.58950
12	1.24648	0.84174	0.04057	0.26522	12	0.45528	1.30551	0.10661	9.57287
13	1.24369	0.86200	0.04142	0.26026	13	0.40197	1.30662	0.10786	9.55630
14	1.24076	0.88124	0.04227	0.25513	14	0.34101	1.30760	0.10911	9.53995
15	+1.23767	+0.89955	+0.04313	-0.24983	15	+0.26992	+1.30844	+0.11036	-9.52375
16	1.23442	0.91701	0.04399	0.24430	16	0.18468	1.30914	0.11160	9.50786
17	1.23101	0.93367	0.04487	0.23863	17	0.07839	1.30970	0.11284	9.49248
18	1.22745	0.94959	0.04575	0.23274	18	9.93605	1.31013	0.11408	9.47741
19	1.22372	0.96485	0.04663	0.22668	19	9.72576	1.31042	0.11532	9.46270
20	+1.21982	+0.97946	+0.04753	-0.22041	20	+9.29778	+1.31057	+0.11656	-9.44855
21	1.21576	0.99347	0.04844	0.21394	21	-9.14728	1.31058	0.11780	9.43505
22	1.21152	1.00693	0.04934	0.20726	22	9.67560	1.31045	0.11903	9.42226
23	1.20710	1.01987	0.05026	0.20040	23	9.90696	1.31019	0.12026	9.41027
24	1.20250	1.03231	0.05120	0.19336	24	0.05494	1.30979	0.12147	9.39915
25	+1.19772	+1.04428	+0.05214	-0.18614	25	-0.16664	+1.30926	+0.12269	-9.38917
26	1.19275	1.05581	0.05308	0.17870	26	0.25531	1.30858	0.12390	9.38021
27	1.18759	1.06632	0.05404	0.17102	27	0.32878	1.30777	0.12511	9.37236
28	1.18222	1.07763	0.05500	0.16314	28	0.39151	1.30681	0.12631	9.36568
29	1.17665	1.08796	0.05597	0.15506	29	0.44619	1.30572	0.12750	9.36003
30	+1.17086	+1.09793	+0.05696	-0.14676	30	-0.49462	+1.30448	+0.12869	-9.35545
31	+1.16486	+1.10755	+0.05796	-0.13824	31	-0.53807	+1.30311	+0.12987	-9.35238

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1861.	<i>f.</i>	Log. <i>g.</i>	<i>g.</i>	Log. <i>h.</i>	<i>h.</i>	Log. <i>i.</i>	<i>r.</i>
Jan. 1	+14.88	0.8591	333 40 ⁰	1.3091	349 5 ⁰	-0.2239	0.000
6	15.75	0.8789	334 51	1.3077	344 22	0.3757	0.014
11	16.59	0.8979	335 49	1.3057	339 36	0.4854	0.027
16	17.39	0.9160	336 35	1.3033	334 48	0.5700	0.041
21	18.16	0.9331	337 12	1.3006	329 57	0.6378	0.055
26	+18.90	0.9490	337 41	1.2976	325 2	-0.6934	0.068
31	19.60	0.9637	338 5	1.2943	320 3	0.7395	0.082
Feb. 5	20.26	0.9772	338 25	1.2910	315 0	0.7780	0.096
10	20.89	0.9896	338 42	1.2877	309 53	0.8103	0.110
15	21.49	1.0011	338 58	1.2845	304 42	0.8370	0.123
20	+22.06	1.0116	339 13	1.2815	299 27	-0.8690	0.137
25	22.60	1.0212	339 29	1.2789	294 9	0.8767	0.151
Mar. 2	23.11	1.0300	339 47	1.2767	288 48	0.8904	0.164
7	23.60	1.0381	340 7	1.2750	283 25	0.9005	0.178
12	24.07	1.0457	340 30	1.2738	278 1	0.9070	0.192
17	+24.52	1.0528	340 57	1.2732	272 36	-0.9103	0.205
22	24.97	1.0595	341 28	1.2732	267 11	0.9102	0.219
27	25.43	1.0659	342 2	1.2738	261 48	0.9069	0.233
April 1	25.90	1.0723	342 40	1.2750	256 28	0.9003	0.246
6	26.38	1.0787	343 22	1.2767	251 10	0.8903	0.260
11	+26.88	1.0852	344 6	1.2789	245 56	-0.8769	0.274
16	27.40	1.0919	344 53	1.2815	240 46	0.8698	0.287
21	27.95	1.0988	345 42	1.2843	235 41	0.8388	0.301
26	28.53	1.1061	346 32	1.2873	230 42	0.8135	0.315
May 1	29.14	1.1139	347 22	1.2905	225 47	0.7833	0.329
6	+29.79	1.1221	348 11	1.2937	220 57	-0.7477	0.342
11	30.46	1.1306	348 59	1.2968	216 12	0.7055	0.356
16	31.16	1.1394	349 45	1.2997	211 31	0.6554	0.370
21	31.89	1.1485	350 29	1.3024	206 54	0.5955	0.383
26	32.65	1.1579	351 9	1.3048	202 21	0.5225	0.397
31	+33.44	1.1675	351 45	1.3068	197 52	-0.4311	0.411
June 5	34.25	1.1772	352 17	1.3084	193 25	0.3114	0.424
10	35.07	1.1870	352 45	1.3096	189 0	0.1414	0.438
15	35.89	1.1967	353 9	1.3103	184 36	9.8526	0.452
20	36.72	1.2064	353 29	1.3105	180 14	-8.5500	0.465
25	+37.55	1.2159	353 45	1.3103	175 51	+9.8069	0.479
30	38.37	1.2252	353 57	1.3097	171 28	0.1183	0.493
July 5	39.18	1.2342	354 5	1.3086	167 4	0.2958	0.507
10	39.98	1.2429	354 10	1.3070	162 38	0.4193	0.520
15	40.77	1.2513	354 13	1.3050	158 10	0.5129	0.534
20	+41.54	1.2593	354 14	1.3027	153 39	+0.5873	0.548
25	42.28	1.2669	354 13	1.3001	149 5	0.6483	0.561
30	42.98	1.2741	354 10	1.2972	144 27	0.6991	0.575
Aug. 4	43.65	1.2809	354 7	1.2941	139 45	0.7490	0.589
9	44.28	1.2872	354 3	1.2910	134 58	0.7783	0.602
14	+44.87	1.2931	353 59	1.2879	130 6	+0.8090	0.616
19	45.43	1.2987	353 56	1.2849	125 10	0.8348	0.630
24	45.97	1.3039	353 54	1.2820	120 10	0.8563	0.643
29	46.49	1.3088	353 53	1.2794	115 5	0.8739	0.657
Sept. 3	46.99	1.3134	353 53	1.2772	109 55	0.8879	0.671
8	+47.47	1.3177	353 56	1.2754	104 41	+0.8984	0.684
13	47.94	1.3218	354 1	1.2741	99 25	0.9057	0.698
18	48.40	1.3258	354 8	1.2733	94 7	0.9097	0.712
23	48.85	1.3297	354 17	1.2731	88 47	0.9105	0.726
28	49.29	1.3335	354 28	1.2736	83 26	0.9082	0.739
Oct. 3	+49.73	1.3373	354 42	1.2746	78 5	+0.9026	0.753
8	50.19	1.3411	354 59	1.2762	72 45	0.8937	0.767
13	+50.68	1.3451	355 17	1.2783	67 27	+0.8812	0.780

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1861.	<i>f</i> .	Log. <i>g</i> .	<i>a</i> .	Log. <i>h</i> .	<i>H</i> .	Log. <i>i</i> .	<i>τ</i> .
Oct. 18	+51.19	1.3493	355 37	1.2808	62 12	+0.8650	0.794
23	51.73	1.3536	355 58	1.2836	56 59	0.8446	0.808
28	52.30	1.3581	356 20	1.2867	51 50	0.8197	0.821
Nov. 2	52.91	1.3629	356 43	1.2899	46 45	0.8897	0.835
7	53.55	1.3679	357 6	1.2932	41 43	0.7538	0.849
12	+54.22	1.3732	357 28	1.2964	36 45	+0.7108	0.862
17	54.92	1.3787	357 50	1.2995	31 51	0.6593	0.876
22	55.66	1.3844	358 10	1.3023	27 0	0.5969	0.890
27	56.43	1.3904	358 28	1.3048	22 12	0.5197	0.903
Dec. 2	57.22	1.3965	358 44	1.3069	17 27	0.4214	0.917
7	+58.04	1.4026	358 58	1.3086	12 44	+0.2892	0.931
12	58.88	1.4088	359 10	1.3098	8 2	0.0928	0.945
17	59.74	1.4150	359 19	1.3105	3 21	+9.7158	0.958
22	60.60	1.4212	359 26	1.3106	358 40	-9.3131	0.972
27	61.46	1.4273	359 30	1.3102	354 0	9.9663	0.986
32	+62.32	1.4333	359 31	1.3093	349 20	-0.2150	0.999

BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

WITH DR. PETERS'S COEFFICIENTS, AND THE NOTATION OF THE CATALOGUE OF STARS
OF THE BRITISH ASSOCIATION.

$$A = -20''.4451 \cos \omega \cos \odot.$$

$$B = -20''.4451 \sin \odot.$$

$$C = \tau - 0.34238 \sin \Omega + 0.00410 \sin 2 \Omega - 0.02519 \sin 2 \odot + 0.00294 \sin (\odot + 82^\circ 34') - 0.00405 \sin 2 \zeta + 0.00135 \sin (\zeta - I'').$$

$$D = -9''.2236 \cos \Omega + 0''.0896 \cos 2 \Omega - 0''.5507 \cos 2 \odot - 0''.0092 \cos (\odot + 280^\circ 22') - 0''.0885 \cos 2 \zeta.$$

$$E = -0''.0481 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0034 \sin 2 \odot.$$

$$a = \cos \alpha \sec \delta.$$

$$b = \sin \alpha \sec \delta.$$

$$c = 46''.0780 + 20''.0560 \sin \alpha \tan \delta.$$

$$d = \cos \alpha \tan \delta.$$

$$a' = \tan \omega \cos \delta - \sin \alpha \sin \delta.$$

$$b' = \cos \alpha \sin \delta.$$

$$c' = 20''.0560 \cos \alpha.$$

$$d' = -\sin \alpha.$$

μ = the annual proper motion in right ascension.

μ' = the annual proper motion in declination.

τ = the time from the beginning of the year in fractional parts of the year.

\odot = the sun's longitude.

ζ = the moon's longitude.

Ω = the longitude of the moon's ascending node.

ω = the obliquity of the ecliptic.

α = the star's mean right ascension for the beginning of the year.

δ = the star's mean declination for the beginning of the year.

α' = the star's apparent right ascension at the time τ .

δ' = the star's apparent declination at the time τ .

$$\alpha' - \alpha = A a + B b + C c + D d + E + \tau \mu.$$

$$\delta' - \delta = A a' + B b' + C c' + D d' + \tau \mu'.$$

The following formulæ may also be used by putting

$$f = 46''.0780 C.$$

$$g \cos G = 20''.0560 C.$$

$$g \sin G = D.$$

$$i = A \tan \alpha.$$

$$h \cos H = B.$$

$$h \sin H = A.$$

$$\alpha' - \alpha = f + \tau \mu + g \sin (G + \alpha) \tan \delta + h \sin (H + \alpha) \sec \delta.$$

$$\delta' - \delta = i \cos \delta + \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta.$$

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		^h ^m ^s	^s	[°] ['] ^{''}	
α ANDROMEDÆ . . .	2	0 1 12.50	+ 3.085	+28° 19' 22.7	+19.91
γ PEGASI (<i>Algenib</i>) . .	3.2	0 6 4.85	3.081	+14 24 37.9	20.03
β Hydri	3	0 18 23.35	3.286	-78 2 16.6	20.24
α CASSIOPEÆ	var.	0 32 38.44	3.360	+55 46 28.2	19.83
β Ceti	2	0 36 36.57	3.016	-18 45 1.2	19.82
α URS. MIN. (<i>Polaris</i>) .	2	1 8 21.30	+18.935	+88 34 6.5	+19.18
δ Ceti	3	1 17 4.60	3.000	- 8 54 6.3	18.75
α Eridani (<i>Achernar</i>) . .	1	1 32 31.92	2.238	-57 56 37.3	18.45
α ARIETIS	2	1 59 20.65	3.366	+22 48 11.9	17.24
γ Ceti	3.4	2 36 6.03	3.102	+ 2 38 52.1	15.89
α CETI	2.3	2 55 0.93	+ 3.127	+ 3 32 30.3	+14.36
α PERSEI	2	3 14 24.97	4.244	+49 21 46.4	13.23
η Tauri	3	3 39 13.61	3.553	+23 40 20.3	11.53
γ Eridani	3	3 51 32.67	2.796	-13 54 23.8	10.57
α TAURI (<i>Aldebaran</i>) . .	1	4 27 56.89	3.435	+16 13 35.6	7.65
α AURIGÆ (<i>Capella</i>) . .	1	5 6 25.60	+ 4.423	+45 51 7.5	+ 4.20
β ORIONIS (<i>Rigel</i>) . . .	1	5 7 51.51	2.880	- 8 21 55.8	4.48
β TAURI	2	5 17 30.42	3.788	+28 29 8.9	3.48
δ ORIONIS	2	5 24 54.42	3.066	- 0 24 19.4	3.04
α Leporis	3	5 26 36.07	2.648	-17 55 28.4	2.93
ϵ ORIONIS	2	5 29 9.67	+ 3.044	- 1 17 38.1	+ 2.70
α COLUMBÆ	2	5 34 37.10	2.177	-34 9 0.1	2.22
α ORIONIS	var.	5 47 38.81	3.246	+ 7 22 39.1	+ 1.06
μ GEMINORUM	3	6 14 33.09	3.636	+22 34 51.6	- 1.40
α ARGUS (<i>Canopus</i>) . . .	1	6 20 52.11	1.330	-52 37 15.5	1.81
51 (Hév.) Cephei . . .	5	6 34 8.99	+30.454	+87 14 50.6	- 2.97
α CANIS MAJ. (<i>Sirius</i>) . .	1	6 39 1.51	2.647	-16 31 40.5	4.62
ϵ Canis Majoris	2.1	6 53 9.82	2.360	-28 47 8.3	4.61
δ GEMINORUM	3.4	7 11 49.20	3.597	+22 14 4.8	6.18
α^2 GEMINOR. (<i>Castor</i>) . .	2.1	7 25 43.29	3.840	+32 11 20.9	7.44
α CAN. MIN. (<i>Procyon</i>) . .	1	7 32 1.42	+ 3.146	+ 5 34 42.7	- 8.90
β GEMINOR. (<i>Pollux</i>) . .	1.2	7 36 48.33	3.682	+28 21 30.0	8.31
15 Argus	3	8 1 37.50	2.558	-23 54 21.0	10.07
ϵ HYDRÆ	3.4	8 39 24.82	3.189	+ 6 55 35.2	12.87
ϵ URSÆ MAJORIS	3	8 49 40.34	4.142	+48 35 4.0	13.79
ϵ ARGUS	2	9 13 22.11	+ 1.602	-58 41 32.7	-14.89
α HYDRÆ	2	9 20 45.35	2.948	- 8 3 29.5	15.38
θ URSÆ MAJORIS	3	9 23 32.30	4.058	+52 18 29.6	16.12
ϵ LEONIS	3	9 37 57.35	3.424	+24 24 44.7	16.35
α LEONIS (<i>Regulus</i>) . . .	1.2	10 0 57.94	3.202	+12 38 41.9	17.42
η ARGUS	2	10 39 40.58	+ 2.305	-58 57 14.0	-18.73
α URSÆ MAJORIS	2	10 55 7.22	3.775	+62 30 1.4	19.34
δ LEONIS	2.3	11 6 42.72	3.208	+21 17 4.9	19.65
δ HYDRÆ et Crateris . .	3.4	11 12 23.57	+ 2.997	-14 1 36.9	-19.45

FIXED STARS, 1861.

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MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
β LEONIS	2	^h 11 ^m 41 ^s 58.01	+ 3.065	+15° 20' 56.2	-20.10
γ URSE MAJORIS . . .	2.3	11 46 30.17	3.194	+54 28 2.9	20.04
β CHAMÆLEONTIS . . .	5	12 10 15.96	3.323	-78 32 25.6	20.05
α^1 CRUCIS	1	12 18 53.35	3.259	-62 19 39.8	19.94
β CORVI	2.3	12 27 5.35	3.132	-22 37 39.5	19.99
δ CANUM VENATICORUM	3	12 49 31.16	+ 2.822	+39 4 11.2	-19.56
α VIRGINIS (<i>Spica</i>) . .	1	13 17 52.41	3.150	-10 26 5.8	18.95
η URSE MAJORIS . . .	2	13 42 3.55	2.371	+50 0 29.1	18.14
η BOOTIS	3	13 48 3.99	2.862	+19 5 45.5	18.23
β CENTAURI	1	13 54 2.84	4.154	-59 42 0.6	17.72
α BOOTIS (<i>Arcturus</i>) . .	1	14 9 19.30	+ 2.732	+19 54 27.7	-18.91
α^2 CENTAURI	1	14 30 12.01	4.028	-60 15 23.9	15.06
ϵ BOOTIS	2.3	14 38 54.95	2.622	+27 39 43.1	15.44
α^2 LIBRÆ	3	14 43 11.62	+ 3.305	-15 27 42.8	15.23
β URSE MINORIS . . .	2	14 51 8.93	- 0.259	+74 43 23.9	14.78
β LIBRÆ	2	15 9 31.83	+ 3.220	- 8 52 2.7	-13.59
α CORONÆ BOREALIS	2	15 28 48.19	2.538	+27 11 4.8	12.35
α SERPENTIS	2.3	15 37 25.35	+ 2.949	+ 6 51 55.0	11.63
ζ URSE MINORIS . . .	4.5	15 49 6.11	- 2.307	+78 13 13.0	10.84
β^1 SCORPII	2	15 57 21.54	+ 3.479	-19 25 18.4	10.27
δ OPHIUCHI	3	16 7 3.79	+ 3.138	- 3 20 0.3	- 9.62
α SCORPII (<i>Antares</i>) . .	1.2	16 20 53.36	3.666	-26 7 12.8	8.42
η DRACONIS	3.2	16 22 7.37	0.821	+61 49 46.9	8.23
α TRIANGULI AUSTRALIS .	2	16 33 59.06	+ 6.273	-68 45 57.6	7.45
ϵ URSE MINORIS . . .	4.5	17 0 20.61	- 6.423	+82 15 35.9	5.15
α HERCULIS	var.	17 8 18.60	+ 2.732	+14 33 5.2	- 4.43
β DRACONIS	3.2	17 27 17.59	1.353	+52 24 20.4	2.85
α OPHIUCHI	2	17 28 28.97	2.781	+12 39 50.9	2.94
σ OCTANTIS	6	17 49 57.56	109.765	-89 16 41.3	- 0.79
γ DRACONIS	2.3	17 53 22.76	1.394	+51 30 23.5	- 0.61
μ^1 SAGITTARII	4	18 5 26.94	+ 3.587	-21 5 29.3	+ 0.48
δ URSE MINORIS . . .	4.5	18 17 11.07	-19.355	+86 36 8.4	1.52
α LYRÆ (<i>Vega</i>) . . .	1	18 32 13.94	+ 2.031	+38 39 22.3	3.10
β LYRÆ	var.	18 44 56.83	2.215	+33 12 12.2	3.88
ζ AQUILÆ	3	18 59 1.17	2.755	+13 39 35.3	5.04
δ AQUILÆ	3.4	19 18 29.32	+ 3.027	+ 2 50 26.4	+ 6.83
γ AQUILÆ	3	19 39 39.03	2.852	+10 16 37.6	8.46
α AQUILÆ (<i>Altair</i>) . .	1.2	19 44 0.04	2.928	+ 8 30 13.7	9.18
β AQUILÆ	4	19 48 29.06	+ 2.946	+ 6 3 43.2	8.68
λ URSE MINORIS . . .	5	20 2 57.51	-56.594	+88 53 34.8	10.23
α^2 CAPRICORNI	3.4	20 10 20.34	+ 3.333	-12 58 23.5	+10.81
α PAVONIS	2	20 14 38.00	4.801	-57 10 33.6	11.07
α CYGNI	2.1	20 36 41.62	2.043	+44 47 6.3	12.68
δ^1 CYGNI	5.6	21 0 39.90	+ 2.676	+38 4 4.2	+17.46

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
		^h ^m ^s	^s		
ζ Cygni	3	21 7 1.23	+ 2.550	+29° 39' 30.7	+14.54
α CEPHEI	3.2	21 15 15.52	1.439	+61 59 50.5	15.10
β AQUARI	3	21 24 14.27	3.163	— 6 10 50.1	15.62
β CEPHEI	3	21 26 51.18	0.803	+69 57 2.9	15.69
ε Pegasi	2.3	21 37 21.53	2.951	+ 9 14 22.0	16.31
α AQUARI	3	21 56 38.57	+ 3.083	— 0 59 37.9	+17.31
α Gruis	2	21 59 27.32	3.820	—47 37 54.6	17.15
ζ Pegasi	3.4	22 34 31.65	2.990	+10 6 25.0	18.69
α PIS.AUS. (<i>Fomalhaut</i>)	1.2	22 49 57.71	3.330	—30 21 31.5	18.94
α PEGASI (<i>Markab</i>) .	2	22 57 50.33	2.963	+14 27 29.6	19.31
ι Piscium	4.5	23 32 48.12	+ 3.064	+ 4 52 23.8	+19.47
γ Cephei	3.4	23 33 40.30	+ 2.395	+76 51 24.2	+20.07

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1	^m 7	^h 1	^m 7	^h 1	^m 7	^h 1	^m 7	
		88° 34'		88° 34'		88° 34'		88° 34'	
1	85.06	33.90	59.47	33.57	41.05	28.40	32.93	19.48	1
2	84.19	33.95	58.79	33.45	40.66	28.15	32.90	19.20	2
3	83.36	34.01	58.12	33.34	40.28	27.92	32.84	18.91	3
4	82.58	34.06	57.43	33.24	39.87	27.69	32.76	18.61	4
5	81.84	34.10	56.71	33.14	39.43	27.47	32.68	18.31	5
6	81.13	34.17	55.96	33.04	38.93	27.23	32.64	17.97	6
7	80.40	34.25	55.17	32.92	38.41	26.98	32.66	17.63	7
8	79.64	34.33	54.35	32.81	37.91	26.71	32.73	17.28	8
9	78.83	34.41	53.52	32.67	37.42	26.42	32.85	16.95	9
10	77.96	34.47	52.70	32.49	36.95	26.12	33.02	16.62	10
11	77.05	34.53	51.91	32.29	36.54	25.81	33.23	16.30	11
12	76.12	34.59	51.16	32.10	36.18	25.50	33.48	15.97	12
13	75.17	34.60	50.46	31.90	35.86	25.19	33.75	15.69	13
14	74.24	34.58	49.81	31.70	35.59	24.89	34.01	15.41	14
15	73.34	34.55	49.20	31.49	35.37	24.59	34.24	15.14	15
16	72.47	34.52	48.63	31.27	35.18	24.29	34.46	14.86	16
17	71.65	34.50	48.08	31.09	34.99	24.00	34.65	14.59	17
18	70.86	34.46	47.53	30.92	34.79	23.73	34.82	14.31	18
19	70.09	34.42	46.96	30.74	34.59	23.46	34.98	14.03	19
20	69.34	34.38	46.36	30.56	34.36	23.19	35.16	13.73	20
21	68.61	34.35	45.72	30.38	34.10	22.92	35.37	13.40	21
22	67.86	34.34	45.05	30.20	33.82	22.64	35.65	13.07	22
23	67.07	34.32	44.36	29.99	33.53	22.33	35.99	12.76	23
24	66.24	34.31	43.69	29.75	33.26	22.01	36.40	12.45	24
25	65.37	34.29	43.04	29.48	33.05	21.67	36.86	12.15	25
26	64.46	34.22	42.43	29.20	32.91	21.32	37.36	11.87	26
27	63.55	34.16	41.89	28.92	32.85	20.97	37.83	11.61	27
28	62.64	34.05	41.44	28.66	32.85	20.64	38.26	11.37	28
29	61.76	33.95	41.05	28.40	32.88	20.32	38.65	11.13	29
30	60.94	33.82	40.66	28.15	32.92	20.03	39.02	10.88	30
31	60.18	33.69	40.28	27.92	32.93	19.75	39.37	10.66	31
32	59.47	33.57	39.87	27.69	32.93	19.48	39.74	10.41	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1	^m 7	^h 1	^m 7	^h 1	^m 8	^h 1	^m 8	
		88° 34'		88° 34'		88° 34'		88° 34'	
1	39.37	10.66	58.63	4.38	24.46	2.85	51.98	6.46	1
2	39.74	10.41	59.41	4.22	25.45	2.87	52.85	6.69	2
3	40.11	10.15	60.23	4.07	26.46	2.91	53.68	6.93	3
4	40.52	9.87	61.09	3.93	27.45	2.96	54.44	7.16	4
5	40.97	9.59	61.99	3.79	28.41	3.03	55.14	7.39	5
6	41.48	9.30	62.88	3.69	29.35	3.12	55.83	7.63	6
7	42.04	9.01	63.82	3.60	30.25	3.20	56.51	7.86	7
8	42.67	8.75	64.71	3.53	31.12	3.30	57.22	8.06	8
9	43.32	8.51	65.56	3.46	31.94	3.41	57.97	8.25	9
10	43.98	8.29	66.38	3.42	32.73	3.51	58.75	8.46	10
11	44.62	8.08	67.15	3.35	33.51	3.59	59.58	8.67	11
12	45.24	7.88	67.92	3.30	34.32	3.65	60.44	8.88	12
13	45.84	7.68	68.66	3.23	35.18	3.69	61.30	9.12	13
14	46.41	7.51	69.41	3.17	36.10	3.75	62.12	9.38	14
15	46.95	7.32	70.20	3.09	37.07	3.84	62.90	9.68	15
16	47.47	7.12	71.05	3.01	38.08	3.95	63.63	9.97	16
17	48.01	6.91	71.97	2.92	39.07	4.08	64.31	10.27	17
18	48.56	6.69	72.94	2.84	40.05	4.21	64.93	10.55	18
19	49.16	6.47	73.94	2.79	40.99	4.37	65.53	10.83	19
20	49.84	6.24	74.94	2.76	41.85	4.54	66.12	11.11	20
21	50.60	6.01	75.90	2.75	42.65	4.73	66.72	11.35	21
22	51.41	5.81	76.81	2.75	43.42	4.89	67.35	11.59	22
23	52.25	5.64	77.67	2.79	44.18	5.04	68.00	11.84	23
24	53.06	5.49	78.47	2.82	44.94	5.18	68.68	12.12	24
25	53.81	5.36	79.24	2.85	45.73	5.32	69.39	12.41	25
26	54.51	5.24	80.03	2.86	46.57	5.45	70.13	12.69	26
27	55.20	5.11	80.85	2.87	47.43	5.60	70.87	12.99	27
28	55.88	4.97	81.69	2.85	48.32	5.75	71.59	13.31	28
29	56.54	4.83	82.57	2.83	49.24	5.90	72.26	13.65	29
30	57.20	4.69	83.49	2.83	50.16	6.08	72.89	13.99	30
31	57.89	4.54	84.46	2.85	51.08	6.26	73.46	14.33	31
32	58.63	4.38	85.45	2.87	51.98	6.46	73.96	14.67	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1	^m 9	^h 1	^m 9	^h 1	^m 9	^h 1	^m 8	
		88° 34'		88° 34'		88° 34'		88° 34'	
1	13.96	14.67	26.03	25.24	26.81	36.86	75.68	46.64	1
2	14.43	14.99	26.17	25.59	26.72	37.21	75.20	46.92	2
3	14.88	15.31	26.34	25.94	26.64	37.57	74.65	47.22	3
4	15.33	15.63	26.57	26.29	26.54	37.95	74.02	47.52	4
5	15.80	15.92	26.86	26.63	26.37	38.35	73.32	47.81	5
6	16.33	16.22	27.16	27.00	26.12	38.74	72.58	48.07	6
7	16.91	16.50	27.43	27.39	25.79	39.13	71.86	48.30	7
8	17.51	16.81	27.67	27.80	25.42	39.50	71.15	48.53	8
9	18.11	17.14	27.83	28.22	25.03	39.86	70.45	48.75	9
10	18.69	17.50	27.93	28.64	24.64	40.20	69.78	48.94	10
11	19.24	17.89	27.99	29.05	24.27	40.53	69.15	49.13	11
12	19.74	18.27	27.99	29.44	23.92	40.85	68.57	49.34	12
13	20.17	18.65	27.96	29.83	23.59	41.15	67.96	49.55	13
14	20.53	19.02	27.94	30.20	23.28	41.45	67.36	49.76	14
15	20.85	19.38	27.94	30.55	22.98	41.76	66.74	49.98	15
16	21.18	19.73	27.96	30.91	22.69	42.09	66.09	50.20	16
17	21.52	20.07	27.99	31.27	22.40	42.41	65.40	50.42	17
18	21.87	20.41	28.04	31.62	22.08	42.75	64.67	50.63	18
19	22.23	20.75	28.10	31.98	21.72	43.10	63.88	50.85	19
20	22.63	21.07	28.19	32.34	21.29	43.46	63.05	51.05	20
21	23.07	21.40	28.26	32.72	20.82	43.81	62.19	51.21	21
22	23.52	21.75	28.29	33.11	20.30	44.14	61.35	51.36	22
23	23.95	22.10	28.28	33.52	19.74	44.46	60.51	51.50	23
24	24.36	22.47	28.24	33.94	19.16	44.77	59.71	51.63	24
25	24.73	22.88	28.14	34.36	18.58	45.05	58.96	51.74	25
26	25.06	23.29	27.97	34.75	18.02	45.30	58.25	51.85	26
27	25.35	23.70	27.75	35.14	17.50	45.56	57.57	51.97	27
28	25.59	24.11	27.51	35.50	17.01	45.82	56.88	52.11	28
29	25.77	24.51	27.29	35.85	16.55	46.09	56.17	52.25	29
30	25.91	24.88	27.11	36.20	16.13	46.37	55.42	52.39	30
31	26.03	25.24	26.95	36.54	15.68	46.64	54.61	52.51	31
32	26.17	25.59	26.81	36.86	15.20	46.92	53.77	52.62	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	[°] 86 ['] 35	^h 18 ^m 16	[°] 86 ['] 35	^h 18 ^m 16	[°] 86 ['] 35	^h 18 ^m 17	[°] 86 ['] 35	
1	41.74	63.05	44.88	53.47	52.53	47.78	3.35	46.84	1
2	41.77	62.69	45.10	53.24	52.85	47.69	3.66	46.91	2
3	41.79	62.36	45.29	53.01	53.18	47.60	3.99	46.95	3
4	41.82	62.06	45.49	52.78	53.48	47.50	4.33	46.98	4
5	41.85	61.76	45.68	52.53	53.78	47.37	4.69	47.02	5
6	41.87	61.47	45.87	52.27	54.10	47.23	5.05	47.10	6
7	41.89	61.18	46.07	51.99	54.42	47.12	5.42	47.19	7
8	41.90	60.87	46.28	51.71	54.75	47.00	5.79	47.30	8
9	41.90	60.55	46.54	51.42	55.11	46.88	6.16	47.42	9
10	41.91	60.20	46.80	51.16	55.49	46.78	6.52	47.57	10
11	41.95	59.85	47.07	50.91	55.87	46.71	6.86	47.72	11
12	42.00	59.50	47.36	50.67	56.25	46.64	7.18	47.88	12
13	42.09	59.19	47.67	50.46	56.64	46.59	7.49	48.03	13
14	42.18	58.91	47.96	50.25	57.01	46.56	7.79	48.18	14
15	42.28	58.61	48.25	50.06	57.38	46.54	8.08	48.34	15
16	42.40	58.30	48.54	49.90	57.73	46.53	8.36	48.48	16
17	42.55	57.97	48.83	49.74	58.08	46.53	8.66	48.63	17
18	42.68	57.63	49.09	49.57	58.41	46.53	8.95	48.77	18
19	42.81	57.29	49.36	49.41	58.74	46.52	9.26	48.90	19
20	42.93	56.99	49.62	49.22	59.06	46.50	9.57	49.03	20
21	43.04	56.71	49.88	49.03	59.40	46.46	9.90	49.17	21
22	43.15	56.43	50.17	48.83	59.74	46.43	10.23	49.35	22
23	43.26	56.15	50.47	48.64	60.11	46.39	10.56	49.54	23
24	43.37	55.84	50.79	48.44	60.49	46.37	10.87	49.77	24
25	43.49	55.52	51.13	48.26	60.88	46.37	11.15	50.02	25
26	43.63	55.18	51.49	48.10	61.27	46.40	11.42	50.27	26
27	43.80	54.87	51.85	47.97	61.66	46.45	11.67	50.51	27
28	43.99	54.54	52.20	47.86	62.03	46.53	11.91	50.72	28
29	44.21	54.26	52.53	47.78	62.38	46.60	12.14	50.92	29
30	44.44	53.97	52.85	47.69	62.72	46.70	12.39	51.10	30
31	44.66	53.71	53.16	47.60	63.04	46.79	12.63	51.30	31
32	44.88	53.47	53.48	47.50	63.35	46.84	12.89	51.49	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sideral Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sideral Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 17	86° 35'	^h 18 ^m 17	86° 35'	^h 18 ^m 17	86° 36'	^h 18 ^m 17	86° 36'	
1	12.63	51.30	18.03	59.88	17.61	9.79	11.41	19.09	1
2	12.89	51.49	18.13	60.21	17.51	10.14	11.09	19.36	2
3	13.15	51.69	18.22	60.54	17.40	10.49	10.76	19.60	3
4	13.42	51.91	18.31	60.90	17.27	10.85	10.44	19.83	4
5	13.69	52.14	18.39	61.27	17.11	11.19	10.12	20.04	5
6	13.96	52.40	18.43	61.63	16.95	11.52	9.83	20.24	6
7	14.22	52.67	18.45	61.98	16.77	11.83	9.53	20.44	7
8	14.46	52.95	18.45	62.34	16.58	12.12	9.25	20.64	8
9	14.68	53.25	18.45	62.66	16.40	12.40	8.96	20.86	9
10	14.89	53.55	18.45	62.97	16.25	12.67	8.68	21.10	10
11	15.07	53.83	18.45	63.27	16.09	12.94	8.38	21.37	11
12	15.24	54.12	18.45	63.57	15.94	13.23	8.09	21.63	12
13	15.39	54.38	18.46	63.86	15.80	13.54	7.75	21.89	13
14	15.55	54.65	18.48	64.15	15.65	13.86	7.39	22.13	14
15	15.72	54.90	18.51	64.45	15.50	14.20	7.02	22.37	15
16	15.90	55.15	18.54	64.80	15.32	14.54	6.63	22.56	16
17	16.09	55.40	18.56	65.16	15.09	14.87	6.25	22.74	17
18	16.27	55.66	18.55	65.52	14.85	15.21	5.87	22.91	18
19	16.47	55.93	18.52	65.89	14.60	15.52	5.52	23.07	19
20	16.67	56.23	18.47	66.26	14.34	15.80	5.17	23.22	20
21	16.85	56.55	18.39	66.61	14.08	16.06	4.83	23.38	21
22	17.01	56.88	18.30	66.94	13.84	16.32	4.50	23.54	22
23	17.13	57.21	18.20	67.26	13.63	16.56	4.16	23.73	23
24	17.23	57.55	18.12	67.56	13.40	16.80	3.82	23.92	24
25	17.33	57.87	18.05	67.85	13.19	17.06	3.47	24.12	25
26	17.42	58.17	17.96	68.14	12.97	17.33	3.10	24.32	26
27	17.51	58.46	17.89	68.44	12.75	17.61	2.70	24.51	27
28	17.59	58.74	17.83	68.75	12.51	17.90	2.30	24.69	28
29	17.70	59.01	17.77	69.09	12.27	18.20	1.89	24.86	29
30	17.81	59.28	17.69	69.43	11.99	18.51	1.47	25.01	30
31	17.92	59.58	17.61	69.79	11.71	18.81	1.05	25.14	31
32	18.03	59.88	17.51	70.14	11.41	19.09	0.64	25.24	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	[°] 86 ['] 36	^h 18 ^m 16	[°] 18 ['] 36	^h 18 ^m 16	[°] 88 ['] 36	^h 18 ^m 16	[°] 88 ['] 36	
1	60.64	25.24	48.07	27.10	35.50	24.46	26.16	17.82	1
2	60.22	25.33	47.66	27.06	35.14	24.34	25.90	17.56	2
3	59.83	25.42	47.25	27.06	34.77	24.22	25.64	17.27	3
4	59.46	25.51	46.87	27.05	34.37	24.08	25.37	16.96	4
5	59.09	25.61	46.47	27.05	33.97	23.91	25.14	16.65	5
6	58.73	25.73	46.04	27.05	33.56	23.72	24.92	16.34	6
7	58.35	25.87	45.60	27.05	33.18	23.51	24.74	16.02	7
8	57.96	26.02	45.14	27.05	32.81	23.28	24.58	15.69	8
9	57.55	26.17	44.67	27.00	32.47	23.04	24.42	15.36	9
10	57.11	26.31	44.22	26.94	32.13	22.80	24.28	15.04	10
11	56.66	26.42	43.79	26.86	31.83	22.59	24.14	14.75	11
12	56.21	26.50	43.35	26.77	31.53	22.37	23.98	14.47	12
13	55.76	26.57	42.94	26.67	31.23	22.17	23.83	14.20	13
14	55.32	26.62	42.53	26.57	30.92	21.99	23.68	13.91	14
15	54.89	26.67	42.14	26.47	30.60	21.80	23.51	13.63	15
16	54.47	26.69	41.76	26.39	30.30	21.60	23.36	13.32	16
17	54.07	26.72	41.37	26.31	29.98	21.41	23.20	13.01	17
18	53.67	26.76	40.99	26.25	29.65	21.21	23.04	12.68	18
19	53.27	26.82	40.60	26.18	29.31	20.99	22.89	12.33	19
20	52.88	26.88	40.19	26.11	28.98	20.74	22.77	11.98	20
21	52.47	26.95	39.77	26.04	28.67	20.49	22.67	11.62	21
22	52.06	27.02	39.35	25.96	28.37	20.21	22.57	11.25	22
23	51.64	27.09	38.92	25.86	28.07	19.92	22.51	10.90	23
24	51.20	27.16	38.49	25.73	27.79	19.63	22.45	10.56	24
25	50.74	27.21	38.06	25.59	27.55	19.33	22.42	10.25	25
26	50.28	27.23	37.64	25.43	27.32	19.04	22.39	9.95	26
27	49.82	27.23	37.24	25.26	27.09	18.78	22.35	9.66	27
28	49.36	27.21	36.86	25.08	26.88	18.53	22.29	9.37	28
29	48.91	27.18	36.51	24.92	26.65	18.30	22.21	9.07	29
30	48.49	27.14	36.16	24.76	26.41	18.06	22.13	8.76	30
31	48.07	27.10	35.82	24.62	26.16	17.82	22.05	8.43	31
32	47.66	27.06	35.50	24.46	25.90	17.56	21.98	8.09	32

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α ANDROMEDÆ.			γ PEGASI. (Algenib.)			β HYDRÆ.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. North.	Right Ascension.		Dec. South.
	^h 0	^m 1	[°] 28 ['] 19	^h 0	^m 6	[°] 14 ['] 24	^h 0	^m 18	[°] 78 ['] 1
Jan. 1	13.09	0.13	37.2 1.0	5.57	0.11	47.8 0.9	24.49	0.95	90.0 1.2
11	12.96	0.12	36.2 1.2	5.46	0.10	46.9 0.9	23.54	0.85	88.8 1.7
21	12.84	0.10	35.0 1.4	5.36	0.08	46.0 0.9	22.69	0.76	87.1 2.4
31	12.74	0.08	33.6 1.5	5.28	0.07	45.1 1.0	21.93	0.64	84.7 2.8
Feb. 10	12.66	0.06	32.1 1.6	5.21	0.06	44.1 1.0	21.29	0.53	81.9 3.1
20	12.60	0.04	30.5 1.7	5.15	0.04	43.1 0.9	20.76	0.42	78.8 3.4
March 2	12.56	0.01	28.8 1.6	5.11	0.00	42.2 0.8	20.34	0.27	75.4 3.7
12	12.57	0.05	27.2 1.3	5.11	0.05	41.4 0.5	20.07	0.08	71.7 3.8
22	12.62	0.09	25.9 1.0	5.16	0.08	40.9 0.3	19.99	0.08	67.9 3.9
April 1	12.71	0.15	24.9 0.7	5.24	0.13	40.6 0.0	20.07	0.24	64.0 3.8
11	12.86	0.19	24.2 0.4	5.37	0.17	40.6 0.3	20.31	0.38	60.2 3.7
21	13.05	0.21	23.8 0.2	5.54	0.20	40.9 0.6	20.69	0.53	56.5 3.6
May 1	13.26	0.26	23.6 0.2	5.74	0.25	41.5 0.8	21.22	0.67	52.9 3.3
11	13.52	0.30	23.8 0.6	5.99	0.28	42.3 1.2	21.89	0.80	49.6 2.9
21	13.82	0.34	24.4 1.2	6.27	0.30	43.5 1.5	22.69	0.92	46.7 2.4
31	14.16	0.34	25.6 1.5	6.57	0.31	45.0 1.7	23.61	1.00	44.3 2.0
June 10	14.50	0.35	27.1 1.7	6.88	0.32	46.7 2.0	24.61	1.06	42.3 1.6
20	14.85	0.35	28.8 2.0	7.20	0.33	48.7 2.0	25.67	1.10	40.7 1.2
30	15.20	0.34	30.8 2.2	7.53	0.33	50.7 2.2	26.77	1.10	39.5 0.4
July 10	15.54	0.33	33.0 2.4	7.86	0.30	52.9 2.2	27.87	1.08	39.1 0.2
20	15.87	0.29	35.4 2.5	8.16	0.27	55.1 2.1	28.95	1.01	39.3 0.6
30	16.16	0.26	37.9 2.6	8.43	0.25	57.2 2.1	29.96	0.93	39.9 1.2
Aug. 9	16.42	0.22	40.5 2.5	8.68	0.22	59.3 2.0	30.89	0.80	41.1 1.7
19	16.64	0.18	43.0 2.4	8.90	0.19	61.3 1.8	31.69	0.66	42.8 2.3
29	16.82	0.14	45.4 2.3	9.09	0.14	63.1 1.6	32.35	0.51	45.1 2.6
Sept. 8	16.96	0.11	47.7 2.3	9.23	0.11	64.7 1.5	32.86	0.31	47.7 2.8
18	17.07	0.07	50.0 2.2	9.34	0.06	66.2 1.4	33.17	0.14	50.5 3.0
28	17.14	0.03	52.2 1.9	9.40	0.03	67.6 1.0	33.31	0.06	53.5 3.0
Oct. 8	17.17	0.02	54.1 1.5	9.43	0.00	68.6 0.8	33.25	0.25	56.5 3.0
18	17.15	0.04	55.6 1.2	9.43	0.03	69.4 0.5	33.00	0.45	59.5 3.0
28	17.11	0.07	56.8 0.9	9.40	0.05	69.9 0.3	32.55	0.60	62.5 2.5
Nov. 7	17.04	0.09	57.7 0.7	9.35	0.07	70.2 0.1	31.95	0.74	65.0 2.0
17	16.95	0.10	58.4 0.5	9.28	0.09	70.3 0.0	31.21	0.84	67.0 1.7
27	16.85	0.12	58.9 0.1	9.19	0.11	70.3 0.2	30.37	0.93	68.7 1.1
Dec. 7	16.73	0.13	59.0 0.2	9.08	0.11	70.1 0.4	29.44	0.96	69.8 0.4
17	16.60	0.14	58.8 0.6	8.97	0.11	69.7 0.8	28.48	0.98	70.2 0.2
27	16.46	0.13	58.2 0.8	8.86	0.11	68.9 0.8	27.50	0.95	70.0 1.0
37	16.33		57.4	8.75		68.1	26.55		69.0

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	α Cassiopee.		β Ceti.		δ^1 Ceti.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 0 32 ^m	[°] 55° 46'	^h 0 36 ^m	[°] 18° 44'	^h 1 17 ^m	[°] 8° 53'
Jan. 1	39.11 0.28	50.9 0.6	37.56 0.12	62.4 0.4	5.80 0.12	63.9 0.7
11	38.83 0.26	50.3 1.0	37.44 0.12	62.8 0.1	5.68 0.12	64.6 0.5
21	38.57 0.25	49.3 1.4	37.32 0.11	62.9 0.1	5.56 0.12	65.1 0.3
31	38.32 0.23	47.9 1.8	37.21 0.10	62.8 0.3	5.44 0.11	65.4 0.1
Feb. 10	38.09 0.19	46.1 2.2	37.11 0.08	62.5 0.7	5.33 0.10	65.5 0.1
20	37.90 0.14	43.9 2.4	37.03 0.05	61.8 0.9	5.23 0.09	65.4 0.3
March 2	37.76 0.07	41.5 2.5	36.98 0.02	60.9 1.2	5.14 0.06	65.1 0.5
12	37.69 0.00	39.0 2.5	36.96 0.01	59.7 1.4	5.06 0.03	64.6 0.8
22	37.69 0.07	36.5 2.5	36.97 0.05	58.3 1.7	5.05 0.01	63.8 1.0
April 1	37.76 0.14	34.0 2.2	37.02 0.08	56.6 1.9	5.06 0.04	62.8 1.3
11	37.90 0.21	31.8 1.9	37.10 0.13	54.7 2.1	5.10 0.09	61.5 1.5
21	38.11 0.28	29.9 1.7	37.23 0.17	52.6 2.2	5.19 0.14	60.0 1.7
May 1	38.39 0.34	28.2 1.1	37.40 0.20	50.4 2.3	5.33 0.18	58.3 1.9
11	38.73 0.41	27.1 0.6	37.60 0.25	48.1 2.4	5.51 0.21	56.4 2.0
21	39.14 0.45	26.5 0.2	37.85 0.28	45.7 2.4	5.72 0.24	54.4 2.2
31	39.59 0.47	26.3 0.3	38.13 0.31	43.3 2.3	5.96 0.28	52.2 2.2
June 10	40.06 0.49	26.6 0.8	38.44 0.31	41.0 2.2	6.24 0.29	50.0 2.2
20	40.55 0.49	27.4 1.3	38.75 0.32	38.8 2.1	6.53 0.30	47.8 2.1
30	41.04 0.48	28.7 1.7	39.07 0.33	36.7 1.9	6.83 0.32	45.7 2.0
July 10	41.52 0.47	30.4 2.1	39.40 0.31	34.8 1.6	7.15 0.31	43.7 1.8
20	41.99 0.44	32.5 2.5	39.71 0.31	33.2 1.2	7.46 0.31	41.9 1.6
30	42.43 0.40	35.0 2.7	40.02 0.28	32.0 0.9	7.77 0.30	40.3 1.3
Aug. 9	42.83 0.34	37.7 3.0	40.30 0.24	31.1 0.5	8.07 0.26	39.0 1.0
19	43.17 0.30	40.7 3.1	40.54 0.20	30.6 0.3	8.33 0.22	38.0 0.8
29	43.47 0.25	43.8 3.2	40.74 0.17	30.3 0.1	8.55 0.19	37.2 0.4
Sept. 8	43.72 0.19	47.0 3.3	40.91 0.14	30.4 0.4	8.74 0.17	36.8 0.1
18	43.91 0.14	50.3 3.2	41.05 0.10	30.8 0.8	8.91 0.15	36.7 0.2
28	44.05 0.07	53.5 3.1	41.15 0.06	31.6 1.0	9.06 0.11	36.9 0.4
Oct. 8	44.12 0.01	56.6 2.9	41.21 0.02	32.6 1.2	9.17 0.06	37.3 0.7
18	44.13 0.03	59.5 2.8	41.23 0.02	33.8 1.3	9.23 0.03	38.0 0.9
28	44.10 0.09	62.3 2.6	41.21 0.05	35.1 1.4	9.26 0.00	38.9 1.0
Nov. 7	44.01 0.13	64.9 2.1	41.16 0.06	36.5 1.3	9.26 0.02	39.9 1.1
17	43.88 0.17	67.0 1.7	41.10 0.08	37.8 1.3	9.24 0.05	41.0 1.1
27	43.71 0.21	68.7 1.2	41.02 0.10	39.1 1.2	9.19 0.06	42.1 1.1
Dec. 7	43.50 0.22	69.9 0.8	40.92 0.12	40.3 1.0	9.13 0.09	43.2 1.0
17	43.28 0.26	70.7 0.3	40.80 0.12	41.3 0.7	9.04 0.10	44.2 0.9
27	43.02 0.27	71.0 0.2	40.68 0.12	42.0 0.6	8.94 0.12	45.1 0.7
37	42.75	70.8	40.56	42.6	8.82	45.8

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal 0h. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Eridani. (Achernar.)		α ARIETIS.		γ Ceti.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h ^m 1 32	57° 56'	^h ^m 1 59	22° 48'	^h ^m 2 36	2° 38'
Jan. 1	33.50 0.34	47.8 0.3	22.12 0.12	25.1 0.4	7.67 0.10	58.3 0.7
11	33.16 0.33	48.1 0.3	22.00 0.13	24.7 0.5	7.57 0.12	57.6 0.7
21	32.83 0.33	47.8 0.8	21.87 0.14	24.2 0.6	7.45 0.13	56.9 0.6
31	32.50 0.32	47.0 1.4	21.73 0.15	23.6 0.8	7.32 0.14	56.3 0.5
Feb. 10	32.18 0.29	45.6 1.8	21.58 0.14	22.8 0.9	7.18 0.14	55.8 0.4
20	31.89 0.25	43.8 2.3	21.44 0.12	21.9 1.0	7.04 0.13	55.4 0.2
March 2	31.64 0.22	41.5 2.7	21.32 0.10	20.9 1.0	6.91 0.12	55.2 0.1
12	31.42 0.15	38.8 3.0	21.22 0.07	19.9 0.9	6.79 0.10	55.1 0.1
22	31.27 0.09	35.8 3.3	21.15 0.02	19.0 0.8	6.69 0.06	55.2 0.3
April 1	31.18 0.03	32.5 3.4	21.13 0.02	18.2 0.6	6.63 0.03	55.5 0.5
11	31.15 0.04	29.1 3.5	21.15 0.06	17.6 0.4	6.60 0.02	56.0 0.7
21	31.19 0.13	25.6 3.6	21.21 0.10	17.2 0.3	6.62 0.06	56.7 0.8
May 1	31.32 0.19	22.0 3.6	21.31 0.16	16.9 0.0	6.68 0.11	57.5 1.1
11	31.51 0.24	18.4 3.4	21.47 0.21	16.9 0.4	6.79 0.15	58.6 1.3
21	31.75 0.31	15.0 3.3	21.68 0.24	17.3 0.8	6.94 0.19	59.9 1.5
31	32.06 0.36	11.7 3.0	21.92 0.27	18.1 0.9	7.13 0.23	61.4 1.7
June 10	32.42 0.41	8.7 2.6	22.19 0.30	19.0 1.0	7.36 0.26	63.1 1.7
20	32.83 0.45	6.1 2.2	22.49 0.32	20.0 1.1	7.62 0.29	64.8 1.8
30	33.28 0.46	3.9 1.7	22.81 0.34	21.1 1.4	7.91 0.30	66.6 1.8
July 10	33.74 0.47	2.2 1.3	23.15 0.35	22.5 1.7	8.21 0.31	68.4 1.7
20	34.21 0.48	0.9 0.6	23.50 0.35	24.2 1.8	8.52 0.31	70.1 1.7
30	34.69 0.46	0.3 0.0	23.85 0.32	26.0 1.8	8.83 0.31	71.8 1.5
Aug. 9	35.15 0.42	0.3 0.4	24.17 0.30	27.8 1.8	9.14 0.29	73.3 1.3
19	35.57 0.38	0.7 1.1	24.47 0.28	29.6 1.7	9.43 0.27	74.6 1.2
29	35.95 0.33	1.8 1.5	24.75 0.25	31.3 1.7	9.70 0.26	75.8 0.9
Sept. 8	36.28 0.27	3.3 2.0	25.00 0.22	33.0 1.6	9.96 0.23	76.7 0.6
18	36.55 0.22	5.3 2.4	25.22 0.19	34.6 1.4	10.19 0.20	77.3 0.3
28	36.77 0.14	7.7 2.7	25.41 0.16	36.0 1.3	10.39 0.18	77.6 0.1
Oct. 8	36.91 0.06	10.4 2.8	25.57 0.13	37.3 1.1	10.57 0.14	77.7 0.1
18	36.97 0.02	13.2 3.1	25.70 0.10	38.4 1.0	10.71 0.12	77.6 0.4
28	36.95 0.08	16.3 3.0	25.80 0.06	39.4 0.8	10.83 0.09	77.2 0.5
Nov. 7	36.87 0.13	19.3 2.8	25.86 0.03	40.2 0.7	10.92 0.07	76.7 0.7
17	36.74 0.19	22.1 2.4	25.89 0.00	40.9 0.4	10.99 0.02	76.0 0.7
27	36.55 0.25	24.5 2.1	25.89 0.03	41.3 0.3	11.01 0.00	75.3 0.8
Dec. 7	36.30 0.28	26.6 1.7	25.86 0.06	41.6 0.1	11.01 0.02	74.5 0.8
17	36.02 0.31	28.3 1.2	25.80 0.08	41.7 0.1	10.99 0.06	73.7 0.8
27	35.71 0.33	29.5 0.6	25.72 0.10	41.6 0.3	10.93 0.08	72.9 0.8
37	35.38	30.1	25.62	41.3	10.85	72.1

after the 31st of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	α CETI.		α PERSEI.		γ TAURI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 2 ^m 55	[°] 3 ['] 32	^h 3 ^m 14	[°] 49 ['] 21	^h 3 ^m 39	[°] 23 ['] 40
Jan. 1	2.67 0.09	36.6 0.7	27.45 0.14	64.2 0.9	15.73 0.07	31.0 0.0
11	2.58 0.11	35.9 0.7	27.31 0.18	65.1 0.5	15.66 0.10	31.0 0.1
21	2.47 0.13	35.2 0.6	27.13 0.22	65.6 0.2	15.56 0.13	30.9 0.3
31	2.34 0.14	34.6 0.5	26.91 0.24	65.8 0.2	15.43 0.15	30.6 0.3
Feb. 10	2.20 0.15	34.1 0.4	26.67 0.25	65.6 0.6	15.28 0.17	30.3 0.5
20	2.05 0.15	33.7 0.3	26.42 0.25	65.0 1.0	15.11 0.18	29.8 0.5
March 2	1.90 0.13	33.4 0.2	26.17 0.23	64.0 1.3	14.93 0.16	29.3 0.6
12	1.77 0.10	33.2 0.1	25.94 0.19	62.7 1.5	14.77 0.14	28.7 0.6
22	1.67 0.08	33.3 0.2	25.75 0.15	61.2 1.6	14.63 0.12	28.1 0.7
April 1	1.59 0.04	33.5 0.4	25.60 0.10	59.6 1.8	14.51 0.08	27.4 0.6
11	1.55 0.00	33.9 0.6	25.50 0.03	57.8 1.8	14.43 0.03	26.8 0.5
21	1.55 0.05	34.5 0.8	25.47 0.03	56.0 1.8	14.40 0.01	26.3 0.5
May 1	1.60 0.08	35.3 1.0	25.50 0.11	54.2 1.7	14.41 0.05	25.8 0.3
11	1.68 0.13	36.3 1.2	25.61 0.18	52.5 1.5	14.46 0.11	25.5 0.1
21	1.81 0.18	37.5 1.3	25.79 0.23	51.0 1.3	14.57 0.16	25.4 0.1
31	1.99 0.22	38.8 1.5	26.02 0.30	49.7 1.0	14.73 0.21	25.5 0.2
June 10	2.21 0.24	40.3 1.6	26.32 0.34	48.7 0.6	14.94 0.24	25.7 0.5
20	2.45 0.27	41.9 1.8	26.66 0.38	48.1 0.3	15.18 0.27	26.2 0.7
30	2.72 0.29	43.7 1.8	27.04 0.42	47.8 0.0	15.45 0.30	26.9 0.7
July 10	3.01 0.30	45.5 1.7	27.46 0.43	47.8 0.3	15.75 0.31	27.6 0.9
20	3.31 0.31	47.2 1.6	27.89 0.44	48.1 0.6	16.06 0.33	28.5 1.1
30	3.62 0.32	48.8 1.5	28.33 0.45	48.7 1.0	16.39 0.34	29.6 1.1
Aug. 9	3.94 0.30	50.3 1.3	28.78 0.44	49.7 1.2	16.73 0.33	30.7 1.1
19	4.24 0.28	51.6 1.0	29.22 0.43	50.9 1.4	17.06 0.32	31.8 1.1
29	4.52 0.26	52.6 0.9	29.65 0.41	52.3 1.6	17.38 0.30	32.9 1.1
Sept. 8	4.78 0.25	53.5 0.6	30.06 0.39	53.9 1.8	17.68 0.28	34.0 1.0
18	5.03 0.23	54.1 0.4	30.45 0.35	55.7 1.9	17.96 0.27	35.0 1.0
28	5.26 0.20	54.5 0.1	30.80 0.31	57.6 2.1	18.23 0.26	36.0 0.9
Oct. 8	5.46 0.16	54.6 0.2	31.11 0.28	59.7 2.1	18.49 0.24	36.9 0.8
18	5.62 0.13	54.4 0.3	31.39 0.24	61.8 2.2	18.73 0.22	37.7 0.6
28	5.75 0.10	54.1 0.4	31.63 0.19	64.0 2.1	18.95 0.18	38.3 0.6
Nov. 7	5.85 0.08	53.7 0.6	31.82 0.15	66.1 2.0	19.13 0.14	38.9 0.5
17	5.93 0.06	53.1 0.6	31.97 0.11	68.1 2.0	19.27 0.10	39.4 0.4
27	5.99 0.01	52.5 0.8	32.08 0.04	70.1 1.8	19.37 0.07	39.8 0.3
Dec. 7	6.00 0.01	51.7 0.9	32.12 0.01	71.9 1.7	19.44 0.03	40.1 0.2
17	5.99 0.04	50.8 0.9	32.11 0.07	73.6 1.4	19.47 0.01	40.3 0.1
27	5.95 0.08	49.9 0.8	32.04 0.12	75.0 1.0	19.46 0.05	40.4 0.1
37	5.87	49.1	31.92	76.0	19.41	40.5

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ^1 Eridani.		α TAURI. (Aldebaran.)		α AURIGÆ. (Capella.)	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 3 ^m 51	13° 53'	^h 4 ^m 27	16° 13'	^h 5 ^m 6	45° 51'
Jan. 1	34.62 0.08	82.6 1.4	59.14 0.03	42.6 0.3	28.75 0.01	17.0 1.3
11	34.54 0.10	84.0 1.2	59.11 0.07	42.3 0.3	28.74 0.07	18.3 1.1
21	34.44 0.13	85.2 1.0	59.04 0.10	42.0 0.3	28.67 0.12	19.4 0.9
31	34.31 0.16	86.2 0.7	58.94 0.13	41.7 0.3	28.55 0.17	20.3 0.7
Feb. 10	34.15 0.17	86.9 0.3	58.81 0.16	41.4 0.4	28.38 0.21	21.0 0.4
20	33.98 0.18	87.2 0.1	58.65 0.17	41.0 0.3	28.17 0.24	21.4 0.1
March 2	33.80 0.17	87.3 0.2	58.48 0.16	40.7 0.3	27.93 0.25	21.5 0.2
12	33.63 0.15	87.1 0.5	58.32 0.16	40.4 0.3	27.68 0.24	21.3 0.5
22	33.48 0.13	86.6 0.8	58.16 0.15	40.1 0.3	27.44 0.23	20.8 0.9
April 1	33.35 0.10	85.8 1.1	58.01 0.12	39.8 0.2	27.21 0.19	19.9 1.0
11	33.25 0.06	84.7 1.3	57.89 0.07	39.6 0.1	27.02 0.14	18.9 1.2
21	33.19 0.03	83.4 1.6	57.82 0.03	39.5 0.1	26.88 0.10	17.7 1.2
May 1	33.16 0.02	81.8 1.8	57.79 0.02	39.4 0.1	26.78 0.05	16.5 1.4
11	33.18 0.06	80.0 2.0	57.81 0.05	39.5 0.2	26.73 0.02	15.1 1.5
21	33.24 0.12	78.0 2.2	57.86 0.10	39.7 0.4	26.75 0.09	13.6 1.5
31	33.36 0.16	75.8 2.3	57.96 0.15	40.1 0.5	26.84 0.15	12.1 1.4
June 10	33.52 0.19	73.5 2.2	58.11 0.19	40.6 0.6	26.99 0.20	10.7 1.2
20	33.71 0.23	71.3 2.2	58.30 0.22	41.2 0.8	27.19 0.25	9.5 1.2
30	33.94 0.26	69.1 2.1	58.52 0.24	42.0 0.8	27.44 0.29	8.3 0.9
July 10	34.20 0.28	67.0 2.0	58.76 0.28	42.8 0.9	27.73 0.33	7.4 0.7
20	34.48 0.29	65.0 1.8	59.04 0.30	43.7 1.0	28.06 0.36	6.7 0.5
30	34.77 0.30	63.2 1.5	59.34 0.31	44.7 0.9	28.42 0.38	6.2 0.3
Aug. 9	35.07 0.30	61.7 1.2	59.65 0.31	45.6 0.9	28.80 0.41	5.9 0.1
19	35.37 0.29	60.5 1.0	59.96 0.31	46.5 0.8	29.21 0.42	5.8 0.1
29	35.66 0.29	59.5 0.5	60.27 0.31	47.3 0.7	29.63 0.42	5.9 0.2
Sept. 8	35.95 0.27	59.0 0.1	60.58 0.30	48.0 0.6	30.05 0.42	6.1 0.4
18	36.22 0.25	58.9 0.4	60.88 0.29	48.6 0.4	30.47 0.41	6.5 0.6
28	36.47 0.23	59.3 0.7	61.17 0.28	49.0 0.3	30.88 0.40	7.1 0.8
Oct. 8	36.70 0.21	60.0 1.1	61.45 0.25	49.3 0.2	31.28 0.38	7.9 0.9
18	36.91 0.19	61.1 1.4	61.70 0.23	49.5 0.0	31.66 0.36	8.8 0.9
28	37.10 0.16	62.5 1.6	61.98 0.20	49.5 0.1	32.02 0.33	9.7 1.1
Nov. 7	37.26 0.12	64.1 1.8	62.13 0.19	49.4 0.2	32.35 0.29	10.8 1.3
17	37.38 0.08	65.9 1.8	62.32 0.16	49.2 0.3	32.64 0.26	12.1 1.4
27	37.46 0.06	67.7 1.9	62.48 0.12	48.9 0.3	32.90 0.20	13.5 1.5
Dec. 7	37.52 0.01	69.6 1.8	62.60 0.07	48.6 0.3	33.10 0.15	15.0 1.4
17	37.53 0.02	71.4 1.8	62.67 0.04	48.3 0.3	33.25 0.09	16.4 1.3
27	37.51 0.06	73.2 1.6	62.71 0.01	48.0 0.3	33.34 0.03	17.7 1.3
37	37.45	74.8	62.70	47.7	33.37	19.0

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β ORIONIS. (Rigel.)			β TAURI.			δ ORIONIS.		
	Right Ascension.	Dec. South.		Right Ascension.	Dec. North.		Right Ascension.	Dec. South.	
	^h 5	^m 7	^s 8 21	^h 5	^m 17	^s 28 29	^h 5	^m 24	^s 0 24
Jan. 1	53.70	0.02	54.1 1.5	33.06	0.01	15.3 0.4	56.68	0.01	17.0 1.2
11	53.68	0.05	55.6 1.4	33.07	0.03	15.7 0.3	56.69	0.03	18.2 1.1
21	53.63	0.09	57.0 1.2	33.04	0.08	16.0 0.2	56.66	0.07	19.3 1.0
31	53.54	0.13	58.2 1.0	32.96	0.12	16.2 0.2	56.59	0.10	20.3 0.8
Feb. 10	53.41	0.15	59.2 0.7	32.84	0.16	16.4 0.1	56.49	0.14	21.1 0.6
20	53.26	0.17	59.9 0.5	32.68	0.18	16.5 0.0	56.35	0.17	21.7 0.4
March 2	53.09	0.18	60.4 0.2	32.50	0.19	16.5 0.1	56.18	0.18	22.1 0.2
12	52.91	0.18	60.6 0.1	32.31	0.19	16.4 0.3	56.00	0.17	22.3 0.1
22	52.73	0.16	60.5 0.3	32.12	0.18	16.1 0.5	55.83	0.16	22.4 0.1
April 1	52.57	0.14	60.2 0.6	31.94	0.15	15.6 0.5	55.67	0.15	22.8 0.4
11	52.43	0.12	59.6 0.8	31.79	0.12	15.1 0.5	55.52	0.12	21.9 0.5
21	52.31	0.08	58.8 1.0	31.67	0.08	14.6 0.6	55.40	0.08	21.4 0.6
May 1	52.23	0.03	57.8 1.3	31.59	0.03	14.0 0.6	55.32	0.05	20.8 0.8
11	52.20	0.01	56.5 1.4	31.56	0.01	13.4 0.5	55.27	0.00	20.0 0.9
21	52.21	0.04	55.1 1.6	31.57	0.05	12.9 0.5	55.27	0.04	19.1 1.1
31	52.25	0.08	53.5 1.8	31.62	0.11	12.4 0.4	55.31	0.08	18.0 1.3
June 10	52.33	0.13	51.7 1.8	31.73	0.16	12.0 0.3	55.39	0.12	16.7 1.4
20	52.46	0.17	49.9 1.9	31.89	0.21	11.7 0.1	55.51	0.16	15.3 1.5
30	52.63	0.20	48.0 1.9	32.10	0.24	11.6 0.1	55.67	0.19	13.8 1.5
July 10	52.83	0.23	46.1 1.8	32.34	0.26	11.5 0.0	55.86	0.22	12.3 1.4
20	53.06	0.25	44.3 1.6	32.60	0.29	11.5 0.2	56.08	0.24	10.9 1.3
30	53.31	0.26	42.7 1.5	32.89	0.30	11.7 0.2	56.32	0.25	9.6 1.2
Aug. 9	53.57	0.28	41.2 1.2	33.19	0.32	11.9 0.2	56.57	0.28	8.4 1.0
19	53.85	0.28	40.0 0.9	33.51	0.34	12.1 0.3	56.85	0.29	7.4 0.8
29	54.13	0.29	39.1 0.7	33.85	0.34	12.4 0.3	57.14	0.29	6.6 0.5
Sept. 8	54.42	0.29	38.4 0.2	34.19	0.34	12.7 0.3	57.43	0.29	6.1 0.2
18	54.71	0.29	38.2 0.2	34.53	0.33	13.0 0.3	57.72	0.29	5.9 0.0
28	55.00	0.28	38.4 0.4	34.86	0.32	13.3 0.3	58.01	0.28	5.9 0.3
Oct. 8	55.28	0.26	38.8 0.9	35.18	0.31	13.6 0.3	58.29	0.27	6.2 0.5
18	55.54	0.24	39.7 1.2	35.49	0.30	13.9 0.2	58.56	0.26	6.7 1.0
28	55.78	0.22	40.9 1.4	35.79	0.27	14.1 0.3	58.82	0.24	7.7 1.2
Nov. 7	56.00	0.20	42.3 1.6	36.06	0.25	14.4 0.2	59.06	0.21	8.9 1.3
17	56.20	0.17	43.9 1.8	36.31	0.22	14.6 0.3	59.27	0.19	10.2 1.4
27	56.37	0.13	45.7 1.9	36.53	0.19	14.9 0.3	59.46	0.17	11.6 1.5
Dec. 7	56.50	0.09	47.6 1.8	36.72	0.14	15.2 0.3	59.63	0.12	13.1 1.5
17	56.59	0.06	49.4 1.8	36.86	0.09	15.5 0.4	59.75	0.07	14.6 1.4
27	56.65	0.01	51.2 1.7	36.95	0.05	15.9 0.3	59.82	0.04	16.0 1.3
37	56.66		52.9	37.00		16.2	59.86		17.3

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Leporis.		ϵ Orionis.		α Columbae.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 5 ^m 26	[°] 17 ['] 55	^h 5 ^m 29	[°] 1 ['] 17	^h 5 ^m 34	[°] 34 ['] 8
Jan. 1	38.28 0.00	28.0 2.1	11.94 0.01	35.9 1.3	39.28 0.03	61.0 2.8
11	38.28 0.06	30.1 1.8	11.95 0.03	37.2 1.2	39.25 0.08	63.8 2.4
21	38.22 0.10	31.9 1.6	11.92 0.07	38.4 1.0	39.27 0.13	66.2 2.1
31	38.12 0.13	33.5 1.3	11.85 0.11	39.4 0.8	39.14 0.17	68.3 1.7
Feb. 10	37.99 0.16	34.8 1.0	11.74 0.14	40.2 0.6	38.97 0.20	70.0 1.3
20	37.83 0.18	35.8 0.6	11.60 0.16	40.8 0.5	38.77 0.23	71.3 0.8
March 2	37.65 0.19	36.4 0.3	11.44 0.17	41.3 0.3	38.54 0.23	72.1 0.3
12	37.46 0.20	36.7 0.1	11.27 0.17	41.6 0.0	38.31 0.24	72.4 0.0
22	37.26 0.18	36.6 0.4	11.10 0.17	41.6 0.1	38.07 0.23	72.4 0.5
April 1	37.08 0.17	36.2 0.7	10.93 0.15	41.5 0.3	37.84 0.21	71.9 0.9
11	36.91 0.14	35.5 1.0	10.78 0.12	41.2 0.5	37.63 0.19	71.0 1.4
21	36.77 0.10	34.5 1.3	10.66 0.09	40.7 0.8	37.44 0.16	69.6 1.7
May 1	36.67 0.06	33.2 1.5	10.57 0.05	39.9 0.9	37.28 0.11	67.9 2.0
11	36.61 0.02	31.7 1.9	10.52 0.01	39.0 1.0	37.17 0.06	65.9 2.3
21	36.59 0.01	29.9 1.9	10.51 0.04	38.0 1.1	37.11 0.01	63.6 2.5
31	36.60 0.05	28.0 2.1	10.55 0.08	36.9 1.3	37.10 0.03	61.1 2.7
June 10	36.65 0.10	25.9 2.2	10.63 0.11	35.6 1.4	37.13 0.06	58.4 2.8
20	36.75 0.15	23.7 2.4	10.74 0.15	34.2 1.4	37.21 0.12	55.6 2.9
30	36.90 0.18	21.3 2.2	10.89 0.18	32.8 1.5	37.33 0.16	52.7 2.8
July 10	37.08 0.21	19.1 2.1	11.07 0.21	31.3 1.5	37.49 0.20	49.9 2.7
20	37.29 0.23	17.0 2.0	11.28 0.25	29.8 1.4	37.69 0.24	47.2 2.4
30	37.52 0.26	15.0 1.8	11.53 0.26	28.4 1.2	37.98 0.27	44.8 2.1
Aug. 9	37.78 0.28	13.2 1.4	11.79 0.27	27.2 1.0	38.20 0.29	42.7 1.8
19	38.06 0.28	11.8 1.1	12.06 0.28	26.2 0.8	38.49 0.31	40.9 1.4
29	38.34 0.29	10.7 0.8	12.34 0.29	25.4 0.5	38.80 0.32	39.5 0.9
Sept. 8	38.63 0.30	9.9 0.3	12.63 0.29	24.9 0.2	39.12 0.32	38.6 0.3
18	38.93 0.29	9.6 0.3	12.92 0.29	24.7 0.0	39.44 0.32	38.3 0.3
28	39.22 0.29	9.9 0.7	13.21 0.28	24.7 0.3	39.76 0.32	38.6 0.9
Oct. 8	39.51 0.27	10.6 1.1	13.49 0.27	25.0 0.6	40.08 0.30	39.5 1.5
18	39.78 0.26	11.7 1.5	13.76 0.27	25.6 1.0	40.38 0.27	41.0 1.9
28	40.04 0.24	13.2 1.8	14.08 0.25	26.6 1.3	40.65 0.25	42.9 2.2
Nov. 7	40.28 0.21	15.0 2.0	14.28 0.22	27.9 1.4	40.90 0.22	45.1 2.6
17	40.49 0.18	17.0 2.3	14.50 0.19	29.3 1.5	41.12 0.19	47.7 2.9
27	40.67 0.15	19.3 2.4	14.69 0.15	30.8 1.5	41.31 0.15	50.6 3.1
Dec. 7	40.82 0.11	21.7 2.4	14.84 0.12	32.3 1.5	41.46 0.10	53.7 3.1
17	40.93 0.06	24.1 2.4	14.96 0.08	33.8 1.5	41.56 0.05	56.8 3.0
27	40.99 0.01	26.5 2.2	15.04 0.05	35.3 1.3	41.61 0.01	59.8 2.9
37	41.00	28.7	15.09	36.6	41.60	62.7

after the 22d of March it begins at the Sidereal Hr. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.							
Sidereal Day of the Month.	α ORIONIS		μ Geminorum		α Argus. (Canopus.)		
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	
	^h 5 ^m 47	[°] 7 ['] 22	^h 6 ^m 14	[°] 22 ['] 34	^h 6 ^m 20	[°] 52 ['] 36	
Jan. 1	41.19 0.03	41.6 0.9	35.73 0.07	53.8 0.0	54.74 0.04	75.5 3.5	
11	41.22 0.01	40.7 0.8	35.80 0.02	53.8 0.0	54.70 0.10	79.0 3.2	
21	41.21 0.05	39.9 0.6	35.82 0.03	53.8 0.1	54.60 0.17	82.2 2.8	
31	41.16 0.10	39.3 0.5	35.79 0.08	53.9 0.1	54.43 0.23	85.0 2.5	
Feb. 10	41.06 0.13	38.8 0.4	35.71 0.12	54.0 0.1	54.20 0.28	87.5 2.0	
20	40.93 0.15	38.4 0.4	35.59 0.15	54.1 0.1	53.92 0.32	89.5 1.6	
March 2	40.78 0.17	38.0 0.2	35.44 0.17	54.2 0.0	53.60 0.35	91.1 1.1	
12	40.61 0.17	37.8 0.1	35.27 0.18	54.2 0.0	53.25 0.35	92.2 0.5	
22	40.44 0.17	37.7 0.0	35.09 0.18	54.2 0.0	52.90 0.36	92.7 0.1	
April 1	40.27 0.15	37.7 0.1	34.91 0.17	54.2 0.1	52.54 0.35	92.6 0.5	
11	40.12 0.13	37.8 0.2	34.74 0.15	54.1 0.2	52.19 0.32	92.1 1.0	
21	39.99 0.09	38.0 0.3	34.59 0.11	53.9 0.2	51.87 0.28	91.1 1.5	
May 1	39.90 0.06	38.3 0.5	34.48 0.08	53.7 0.3	51.59 0.24	89.6 1.9	
11	39.84 0.02	38.8 0.6	34.40 0.04	53.4 0.2	51.35 0.20	87.7 2.2	
21	39.82 0.02	39.4 0.6	34.36 0.01	53.2 0.1	51.15 0.14	85.5 2.6	
31	39.84 0.07	40.0 0.8	34.37 0.05	53.1 0.1	51.01 0.08	82.9 2.9	
June 10	39.91 0.11	40.8 0.8	34.42 0.09	53.0 0.1	50.93 0.01	80.0 3.0	
20	40.02 0.14	41.6 0.9	34.51 0.14	52.9 0.1	50.92 0.05	77.0 3.3	
30	40.16 0.18	42.5 1.0	34.65 0.18	52.8 0.0	50.97 0.10	73.7 3.2	
July 10	40.34 0.21	43.5 1.0	34.83 0.20	52.8 0.0	51.07 0.16	70.5 3.0	
20	40.55 0.24	44.5 0.9	35.03 0.23	52.8 0.0	51.23 0.22	67.5 2.9	
30	40.79 0.25	45.4 0.8	35.26 0.26	52.8 0.1	51.45 0.27	64.6 2.6	
Aug. 9	41.04 0.27	46.2 0.7	35.52 0.28	52.9 0.0	51.72 0.30	62.0 2.3	
19	41.31 0.28	46.9 0.6	35.80 0.29	52.9 0.0	52.02 0.34	59.7 1.9	
29	41.59 0.29	47.5 0.4	36.09 0.30	52.9 0.1	52.36 0.36	57.8 1.4	
Sept. 8	41.88 0.29	47.9 0.2	36.39 0.32	52.8 0.1	52.72 0.39	56.4 0.8	
18	42.17 0.30	48.1 0.1	36.71 0.32	52.7 0.2	53.11 0.42	55.6 0.0	
28	42.47 0.30	48.0 0.3	37.03 0.33	52.5 0.3	53.53 0.42	55.6 0.6	
Oct. 8	42.77 0.29	47.7 0.5	37.36 0.32	52.2 0.3	53.95 0.40	56.2 1.2	
18	43.06 0.27	47.2 0.8	37.68 0.31	51.9 0.4	54.35 0.38	57.4 1.8	
28	43.33 0.26	46.4 0.9	37.99 0.30	51.5 0.4	54.73 0.35	59.2 2.3	
Nov. 7	43.59 0.24	45.5 1.0	38.29 0.28	51.1 0.4	55.08 0.32	61.5 2.8	
17	43.83 0.22	44.5 1.0	38.57 0.27	50.7 0.4	55.40 0.28	64.3 3.2	
27	44.05 0.19	43.5 1.1	38.84 0.24	50.3 0.3	55.68 0.21	67.5 3.4	
Dec. 7	44.24 0.15	42.4 1.0	39.08 0.19	50.0 0.3	55.89 0.15	70.9 3.6	
17	44.39 0.10	41.4 1.0	39.27 0.14	49.7 0.2	56.04 0.08	74.5 3.7	
27	44.49 0.06	40.4 1.0	39.41 0.10	49.5 0.1	56.12 0.01	78.2 3.5	
37	44.55	39.4	39.51	49.4	56.13	81.7	

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. 4/10th the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	51 (Hcv.) Cephei.		α CANIS MAJORIS. (Sirius.)		ε Canis Majoris.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h ^m 6 34	87° 14'	^h ^m 6 39	16° 31'	^h ^m 6 53	28° 46'
Jan. 1	47.78 0.34	53.5 3.2	3.78 0.06	40.2 2.4	12.10 0.06	67.7 3.0
11	48.12 0.60	56.7 3.0	3.84 0.01	42.6 2.2	12.16 0.01	70.7 2.8
21	47.52 1.48	59.7 2.9	3.85 0.03	44.8 1.9	12.17 0.04	73.5 2.5
31	46.04 2.28	62.6 2.6	3.82 0.08	46.7 1.7	12.13 0.09	76.0 2.2
Feb. 10	43.76 2.99	65.2 2.1	3.74 0.12	48.4 1.4	12.04 0.14	78.2 1.8
20	40.77 3.56	67.3 1.7	3.62 0.15	49.8 1.1	11.90 0.17	80.0 1.5
March 2	37.21 3.97	69.0 1.1	3.47 0.18	50.9 0.8	11.73 0.19	81.5 1.0
12	33.24 4.22	70.1 0.5	3.29 0.19	51.7 0.4	11.54 0.21	82.5 0.7
22	29.02 4.28	70.6 0.2	3.10 0.19	52.1 0.1	11.33 0.22	83.2 0.3
April 1	24.74 4.17	70.4 0.7	2.91 0.18	52.2 0.3	11.11 0.21	83.5 0.2
11	20.57 3.89	69.7 1.1	2.73 0.17	51.9 0.5	10.90 0.20	83.3 0.6
21	16.68 3.46	68.6 1.6	2.56 0.15	51.4 0.8	10.70 0.18	82.7 0.9
May 1	13.22 2.92	67.0 2.1	2.41 0.11	50.6 1.1	10.52 0.15	81.8 1.3
11	10.30 2.27	64.9 2.6	2.30 0.07	49.5 1.3	10.37 0.11	80.5 1.5
21	8.03 1.56	62.3 3.0	2.23 0.04	48.2 1.5	10.26 0.06	79.0 1.9
31	6.47 0.80	59.3 3.1	2.19 0.00	46.7 1.8	10.20 0.03	77.1 2.2
June 10	5.67 0.02	56.2 3.2	2.19 0.03	44.9 1.9	10.17 0.00	74.9 2.3
20	5.65 0.76	53.0 3.2	2.22 0.07	43.0 1.9	10.17 0.05	72.6 2.4
30	6.41 1.53	49.8 3.2	2.29 0.11	41.1 2.0	10.22 0.09	70.2 2.5
July 10	7.94 2.27	46.6 3.0	2.40 0.15	39.1 1.9	10.31 0.13	67.7 2.4
20	10.21 2.94	43.6 2.8	2.55 0.18	37.2 1.9	10.44 0.16	65.3 2.4
30	13.15 3.54	40.8 2.6	2.73 0.20	35.3 1.7	10.60 0.19	62.9 2.2
Aug. 9	16.69 4.08	38.2 2.3	2.93 0.23	33.6 1.4	10.79 0.22	60.7 1.9
19	20.77 4.53	35.9 2.0	3.16 0.25	32.2 1.3	11.01 0.25	58.8 1.6
29	25.30 4.90	33.9 1.5	3.41 0.27	30.9 0.8	11.26 0.28	57.2 1.3
Sept. 8	30.20 5.19	32.4 1.2	3.68 0.28	30.1 0.4	11.54 0.29	55.9 0.7
18	35.39 5.36	31.2 0.6	3.96 0.29	29.7 0.1	11.83 0.31	55.2 0.1
28	40.75 5.42	30.6 0.1	4.25 0.30	29.8 0.5	12.14 0.32	55.1 0.4
Oct. 8	46.17 5.38	30.5 0.3	4.55 0.29	30.3 0.8	12.46 0.31	55.5 0.9
18	51.55 5.22	30.8 0.7	4.84 0.29	31.1 1.4	12.77 0.31	56.4 1.4
28	56.77 4.96	31.5 1.1	5.13 0.28	32.5 1.8	13.08 0.30	57.8 1.9
Nov. 7	61.72 4.53	32.6 1.7	5.41 0.27	34.3 2.0	13.38 0.29	59.7 2.3
17	66.25 4.00	34.3 2.2	5.68 0.25	36.3 2.3	13.67 0.26	62.0 2.6
27	70.25 3.35	36.5 2.5	5.93 0.22	38.6 2.5	13.93 0.23	64.6 2.8
Dec. 7	73.60 2.61	39.0 2.8	6.15 0.18	41.1 2.5	14.16 0.19	67.4 3.0
17	76.21 1.78	41.8 3.1	6.33 0.13	43.6 2.6	14.35 0.14	70.4 3.1
27	77.99 0.87	44.9 3.0	6.46 0.08	46.2 2.5	14.49 0.09	73.5 3.0
37	78.86	47.9	6.54	48.7	14.58	76.5

after the 22d of March it begins at the Sidereal Ob. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Geminorum.		α^2 GEMINORUM. (Castor.)		α CANIS MINORIS. (Procyon.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 7 ^m 11	22° 13'	^h 7 ^m 25	32° 11'	^h 7 ^m 32	5° 34'
Jan. 1	51.84 0.13	63.4 0.2	46.16 0.16	18.1 0.5	3.79 0.13	41.0 1.3
11	51.97 0.08	63.2 0.1	46.32 0.10	18.6 0.5	3.92 0.08	39.7 1.1
21	52.05 0.02	63.1 0.1	46.42 0.04	19.1 0.6	4.00 0.04	38.6 1.0
31	52.07 0.03	63.2 0.1	46.46 0.02	19.7 0.7	4.04 0.01	37.6 0.8
Feb. 10	52.04 0.07	63.3 0.3	46.44 0.08	20.4 0.7	4.03 0.06	36.8 0.6
20	51.97 0.12	63.6 0.2	46.36 0.12	21.1 0.7	3.97 0.10	36.2 0.5
March 2	51.85 0.15	63.8 0.2	46.24 0.16	21.8 0.6	3.87 0.13	35.7 0.3
12	51.70 0.17	64.0 0.2	46.08 0.18	22.4 0.5	3.74 0.15	35.4 0.2
22	51.53 0.18	64.2 0.2	45.90 0.19	22.9 0.3	3.59 0.17	35.2 0.0
April 1	51.35 0.17	64.4 0.1	45.71 0.19	23.2 0.2	3.42 0.17	35.2 0.1
11	51.18 0.16	64.5 0.1	45.52 0.18	23.4 0.1	3.25 0.15	35.3 0.2
21	51.02 0.15	64.6 0.0	45.34 0.17	23.5 0.2	3.10 0.14	35.5 0.3
May 1	50.87 0.12	64.6 0.0	45.17 0.14	23.3 0.3	2.96 0.12	35.8 0.4
11	50.75 0.08	64.6 0.1	45.03 0.10	23.0 0.4	2.84 0.09	36.2 0.4
21	50.67 0.03	64.5 0.2	44.93 0.05	22.6 0.5	2.75 0.05	36.6 0.5
31	50.64 0.00	64.3 0.1	44.88 0.01	22.1 0.6	2.70 0.02	37.1 0.6
June 10	50.64 0.04	64.2 0.2	44.87 0.03	21.5 0.7	2.68 0.01	37.7 0.7
20	50.68 0.07	64.0 0.2	44.90 0.06	20.8 0.8	2.69 0.05	38.4 0.7
30	50.75 0.12	63.8 0.2	44.96 0.09	20.0 0.8	2.74 0.08	39.1 0.7
July 10	50.87 0.15	63.6 0.2	45.05 0.14	19.2 0.8	2.82 0.11	39.8 0.7
20	51.02 0.18	63.4 0.2	45.19 0.19	18.4 0.9	2.93 0.14	40.5 0.6
30	51.20 0.20	63.2 0.3	45.38 0.22	17.5 0.9	3.07 0.17	41.1 0.5
Aug. 9	51.40 0.23	62.9 0.3	45.60 0.24	16.6 0.9	3.24 0.20	41.6 0.4
19	51.63 0.26	62.6 0.3	45.84 0.26	15.7 0.9	3.44 0.22	42.0 0.3
29	51.89 0.28	62.3 0.5	46.10 0.29	14.8 0.9	3.66 0.23	42.3 0.1
Sept. 8	52.17 0.29	61.8 0.5	46.39 0.31	13.9 0.9	3.89 0.26	42.4 0.2
18	52.46 0.31	61.3 0.6	46.70 0.33	13.0 0.9	4.15 0.28	42.2 0.5
28	52.77 0.31	60.7 0.7	47.03 0.34	12.1 0.9	4.43 0.29	41.7 0.7
Oct. 8	53.08 0.33	60.0 0.8	47.37 0.35	11.2 0.8	4.72 0.30	41.0 0.9
18	53.41 0.33	59.2 0.8	47.72 0.37	10.4 0.8	5.02 0.30	40.1 1.0
28	53.74 0.32	58.4 0.8	48.09 0.36	9.6 0.7	5.32 0.31	39.1 1.2
Nov. 7	54.06 0.31	57.6 0.8	48.45 0.35	8.9 0.6	5.63 0.30	37.9 1.5
17	54.37 0.31	56.8 0.8	48.80 0.34	8.3 0.4	5.93 0.28	36.4 1.6
27	54.68 0.29	56.0 0.7	49.14 0.31	7.9 0.3	6.21 0.27	34.8 1.6
Dec. 7	54.97 0.24	55.3 0.5	49.45 0.28	7.6 0.1	6.48 0.24	33.2 1.6
17	55.21 0.20	54.8 0.5	49.73 0.23	7.5 0.1	6.72 0.20	31.6 1.5
27	55.41 0.16	54.3 0.3	49.96 0.18	7.6 0.3	6.92 0.16	30.1 1.4
37	55.57	54.0	50.14	7.9	7.08	28.7

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♊ Geminorum. (Pollux.)		15 Argus.		♋ Hydre.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 7 ^m 36	[°] 28 ['] 21	^h 8 ^m 1	[°] 23 ['] 54	^h 8 ^m 39	[°] 6 ['] 55
Jan. 1	51.09 0.16	26.6 0.1	39.68 0.15	20.3 2.9	27.07 0.20	30.7 1.5
11	51.25 0.11	26.7 0.2	39.83 0.09	23.2 2.8	27.27 0.15	29.2 1.3
21	51.36 0.05	26.9 0.4	39.92 0.04	26.0 2.7	27.42 0.10	27.9 1.0
31	51.41 0.01	27.3 0.5	39.96 0.02	28.7 2.4	27.52 0.05	26.9 0.8
Feb. 10	51.40 0.06	27.8 0.6	39.94 0.07	31.1 2.1	27.57 0.00	26.1 0.6
20	51.34 0.11	28.4 0.6	39.87 0.10	33.2 1.8	27.57 0.05	25.5 0.4
March 2	51.23 0.14	29.0 0.5	39.77 0.13	35.0 1.4	27.52 0.08	25.1 0.2
12	51.09 0.17	29.5 0.5	39.64 0.16	36.4 1.1	27.44 0.11	24.9 0.1
22	50.92 0.18	30.0 0.4	39.48 0.19	37.5 0.7	27.33 0.13	24.8 0.0
April 1	50.74 0.18	30.4 0.2	39.29 0.19	38.2 0.4	27.20 0.15	24.8 0.2
11	50.56 0.18	30.6 0.1	39.10 0.19	38.6 0.0	27.05 0.15	25.0 0.2
21	50.38 0.17	30.7 0.0	38.91 0.18	38.6 0.4	26.90 0.15	25.2 0.4
May 1	50.21 0.14	30.7 0.1	38.73 0.16	38.2 0.7	26.75 0.13	25.6 0.5
11	50.07 0.10	30.6 0.2	38.57 0.13	37.5 1.0	26.62 0.11	26.1 0.4
21	49.97 0.06	30.4 0.4	38.44 0.10	36.5 1.4	26.51 0.09	26.5 0.4
31	49.91 0.02	30.0 0.5	38.34 0.07	35.1 1.5	26.42 0.07	26.9 0.5
June 10	49.89 0.02	29.5 0.5	38.27 0.04	33.6 1.8	26.35 0.03	27.4 0.5
20	49.91 0.05	29.0 0.5	38.23 0.01	31.8 2.0	26.32 0.00	27.9 0.5
30	49.96 0.09	28.5 0.6	38.22 0.02	29.8 2.1	26.32 0.03	28.4 0.5
July 10	50.05 0.12	27.9 0.6	38.24 0.07	27.7 2.1	26.35 0.05	28.9 0.5
20	50.17 0.16	27.3 0.7	38.31 0.10	25.6 2.0	26.40 0.08	29.4 0.4
30	50.33 0.20	26.6 0.7	38.41 0.14	23.6 1.9	26.48 0.11	29.8 0.3
Aug. 9	50.53 0.22	25.9 0.8	38.55 0.16	21.7 1.8	26.59 0.13	30.1 0.2
19	50.75 0.24	25.1 0.8	38.71 0.18	19.9 1.6	26.72 0.17	30.3 0.0
29	50.99 0.27	24.3 0.8	38.89 0.21	18.3 1.3	26.89 0.20	30.3 0.1
Sept. 8	51.26 0.29	23.5 0.9	39.10 0.25	17.0 0.9	27.09 0.22	30.2 0.4
18	51.55 0.31	22.6 0.9	39.35 0.28	16.1 0.4	27.31 0.24	29.8 0.6
28	51.86 0.33	21.7 1.0	39.63 0.30	15.7 0.1	27.55 0.26	29.2 0.8
Oct. 8	52.19 0.34	20.7 1.0	39.93 0.30	15.8 0.6	27.81 0.29	28.4 1.1
18	52.53 0.35	19.7 0.9	40.23 0.31	16.4 1.0	28.10 0.30	27.3 1.3
28	52.88 0.35	18.8 0.9	40.54 0.32	17.4 1.5	28.40 0.32	26.0 1.5
Nov. 7	53.23 0.34	17.9 0.8	40.86 0.31	18.9 1.9	28.72 0.32	24.5 1.6
17	53.57 0.33	17.1 0.7	41.17 0.32	20.8 2.3	29.04 0.31	22.9 1.7
27	53.90 0.30	16.4 0.5	41.49 0.29	23.1 2.6	29.35 0.30	21.2 1.8
Dec. 7	54.20 0.28	15.9 0.3	41.78 0.25	25.7 2.8	29.65 0.29	19.4 1.7
17	54.48 0.24	15.6 0.2	42.03 0.21	28.5 3.0	29.94 0.26	17.7 1.7
27	54.72 0.19	15.4 0.0	42.24 0.17	31.5 2.9	30.20 0.22	16.0 1.5
37	54.91	15.4	42.41	34.4	30.42	14.5

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	♋ Ursæ Majoris.		♐ Argus.		♒ HYDRÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 8 ^m 49	[°] 48 ['] 34	^h 9 ^m 13	[°] 58 ['] 41	^h 9 ^m 20	[°] 8 ['] 3
Jan. 1	43.61 0.29	52.9 0.9	24.44 0.27	25.7 3.8	47.35 0.23	32.3 2.3
11	43.90 0.23	53.8 1.2	24.71 0.19	29.5 3.8	47.58 0.18	34.6 2.2
21	44.13 0.16	55.0 1.5	24.90 0.11	33.3 3.9	47.76 0.13	36.8 2.0
31	44.29 0.08	56.5 1.6	25.01 0.02	37.2 3.8	47.89 0.08	38.8 1.8
Feb. 10	44.37 0.00	58 1 1.7	25.03 0.05	41.0 3.6	47.97 0.04	40.6 1.6
20	44.37 0.08	59.8 1.8	24.98 0.13	44.6 3.4	48.01 0.01	42.2 1.3
March 2	44.29 0.13	61.6 1.7	24.85 0.20	48.0 3.1	48.00 0.05	43.5 1.0
12	44.16 0.17	63.3 1.5	24.65 0.25	51.1 2.7	47.95 0.09	44.5 0.8
22	43.99 0.21	64.8 1.2	24.40 0.30	53.8 2.3	47.86 0.11	45.3 0.6
April 1	43.78 0.24	66.0 1.0	24.10 0.32	56.1 1.8	47.75 0.13	45.9 0.3
11	43.54 0.25	67.0 0.7	23.78 0.34	57.9 1.4	47.62 0.14	46.2 0.0
21	43.29 0.24	67.7 0.4	23.44 0.36	59.3 0.8	47.48 0.14	46.2 0.1
May 1	43.05 0.22	68.1 0.0	23.08 0.35	60.1 0.3	47.34 0.13	46.1 0.3
11	42.83 0.20	68.1 0.4	22.73 0.34	60.4 0.3	47.21 0.12	45.8 0.5
21	42.63 0.18	67.7 0.7	22.39 0.32	60.1 0.7	47.09 0.11	45.3 0.7
31	42.45 0.14	67.0 1.0	22.07 0.29	59.4 1.1	46.98 0.09	44.6 0.9
June 10	42.31 0.09	66.0 1.2	21.78 0.26	58.3 1.6	46.89 0.07	43.7 0.9
20	42.22 0.03	64.8 1.4	21.52 0.22	56.7 2.1	46.82 0.04	42.8 0.9
30	42.19 0.01	63.4 1.7	21.30 0.17	54.6 2.4	46.78 0.02	41.9 1.1
July 10	42.20 0.05	61.7 1.9	21.13 0.11	52.2 2.5	46.76 0.01	40.8 1.1
20	42.25 0.08	59.8 2.0	21.02 0.05	49.7 2.9	46.77 0.04	39.7 1.2
30	42.33 0.13	57.8 2.1	20.97 0.01	46.8 3.0	46.81 0.06	38.5 1.1
Aug. 9	42.46 0.18	55.7 2.1	20.98 0.08	43.8 2.9	46.87 0.09	37.4 1.1
19	42.64 0.22	53.6 2.2	21.06 0.15	40.9 2.9	46.96 0.13	36.3 0.8
29	42.86 0.25	51.4 2.2	21.21 0.21	38.0 2.7	47.09 0.15	35.5 0.5
Sept. 8	43.11 0.30	49.2 2.2	21.42 0.27	35.3 2.3	47.24 0.18	35.0 0.3
18	43.41 0.34	47.0 2.1	21.69 0.34	33.0 1.8	47.42 0.20	34.7 0.0
28	43.75 0.37	44.9 2.0	22.03 0.39	31.2 1.4	47.62 0.23	34.7 0.3
Oct. 8	44.12 0.40	42.9 1.8	22.42 0.44	29.8 0.7	47.85 0.27	35.0 0.6
18	44.52 0.43	41.1 1.6	22.86 0.48	29.1 0.1	48.12 0.29	35.6 1.1
28	44.95 0.44	39.5 1.4	23.34 0.50	29.0 0.5	48.41 0.31	36.7 1.4
Nov. 7	45.39 0.45	38.1 1.1	23.84 0.51	29.5 1.1	48.72 0.32	38.1 1.7
17	45.84 0.45	37.0 0.8	24.35 0.50	30.6 1.8	49.04 0.32	39.8 1.9
27	46.29 0.44	36.2 0.3	24.85 0.47	32.4 2.4	49.36 0.32	41.7 2.2
Dec. 7	46.73 0.41	35.9 0.0	25.32 0.44	34.8 2.9	49.68 0.30	43.9 2.3
17	47.14 0.37	35.9 0.3	25.76 0.38	37.7 3.2	49.98 0.29	46.2 2.3
27	47.51 0.32	36.2 0.7	26.14 0.31	40.9 3.6	50.27 0.25	48.5 2.4
37	47.83	36.9	26.45	44.5	50.52	50.9

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Ursa Majoris		♋ Leonis.		♋ LEONIS. (Regulus.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 9 ^m 23	52° 17'	^h 9 ^m 37	24° 24'	^h 10 ^m 0	12° 38'
Jan. 1	35.56 0.35	75.2 0.9	59.62 0.26	34.0 0.7	59.93 0.28	32.9 1.4
11	35.91 0.28	76.1 1.2	59.88 0.23	33.3 0.4	60.21 0.23	31.5 1.2
21	36.19 0.20	77.3 1.5	60.11 0.18	32.9 0.2	60.44 0.18	30.3 1.1
31	36.39 0.13	78.8 1.8	60.29 0.12	32.7 0.2	60.62 0.13	29.2 0.7
Feb. 10	36.52 0.05	80.6 1.9	60.41 0.06	32.9 0.4	60.75 0.06	28.5 0.3
20	36.57 0.02	82.5 2.0	60.47 0.01	33.3 0.5	60.83 0.04	28.2 0.0
March 2	36.55 0.09	84.5 2.0	60.48 0.03	33.8 0.7	60.87 0.01	28.2 0.1
12	36.46 0.16	86.5 1.8	60.45 0.07	34.5 0.8	60.86 0.05	28.3 0.2
22	36.30 0.21	88.3 1.6	60.38 0.11	35.3 0.9	60.81 0.08	28.5 0.4
April 1	36.09 0.23	89.9 1.4	60.27 0.13	36.2 0.9	60.73 0.10	28.9 0.5
11	35.86 0.25	91.3 1.0	60.14 0.14	37.1 0.7	60.63 0.12	29.4 0.5
21	35.61 0.28	92.3 0.7	60.00 0.16	37.8 0.6	60.51 0.13	29.9 0.6
May 1	35.33 0.26	93.0 0.3	59.84 0.15	38.4 0.5	60.38 0.13	30.5 0.5
11	35.07 0.24	93.3 0.1	59.69 0.14	38.9 0.4	60.25 0.12	31.0 0.5
21	34.83 0.21	93.2 0.5	59.55 0.11	39.3 0.3	60.13 0.11	31.5 0.5
31	34.62 0.18	92.7 0.9	59.44 0.09	39.6 0.2	60.02 0.10	32.0 0.4
June 10	34.44 0.15	91.8 1.2	59.35 0.08	39.8 0.1	59.92 0.08	32.4 0.4
20	34.29 0.10	90.6 1.3	59.27 0.06	39.7 0.3	59.84 0.06	32.8 0.3
30	34.19 0.06	89.3 1.7	59.21 0.02	39.4 0.4	59.78 0.04	33.1 0.2
July 10	34.13 0.01	87.6 2.0	59.19 0.00	39.0 0.5	59.74 0.02	33.3 0.1
20	34.12 0.03	85.6 2.3	59.19 0.03	38.5 0.7	59.72 0.01	33.4 0.1
30	34.15 0.09	83.3 2.4	59.22 0.05	37.8 0.8	59.73 0.04	33.3 0.2
Aug. 9	34.24 0.13	80.9 2.5	59.27 0.09	37.0 0.9	59.77 0.06	33.1 0.3
19	34.37 0.18	78.4 2.5	59.36 0.12	36.1 1.1	59.83 0.08	32.8 0.4
29	34.55 0.22	75.9 2.5	59.48 0.15	35.0 1.3	59.91 0.12	32.4 0.6
Sept. 8	34.77 0.27	73.4 2.5	59.63 0.18	33.7 1.4	60.03 0.15	31.8 0.8
18	35.04 0.31	70.9 2.5	59.81 0.21	32.3 1.6	60.18 0.17	31.0 1.1
28	35.35 0.36	68.4 2.5	60.02 0.25	30.7 1.7	60.35 0.21	29.9 1.3
Oct. 8	35.71 0.40	65.9 2.3	60.27 0.28	29.0 1.8	60.56 0.25	28.6 1.5
18	36.11 0.43	63.6 2.0	60.55 0.30	27.2 1.8	60.81 0.27	27.1 1.6
28	36.54 0.45	61.6 1.8	60.85 0.33	25.4 1.8	61.08 0.30	25.5 1.7
Nov. 7	36.99 0.47	59.8 1.4	61.18 0.34	23.6 1.8	61.38 0.32	23.8 1.7
17	37.46 0.48	58.4 1.1	61.52 0.35	21.8 1.7	61.70 0.33	22.1 1.8
27	37.94 0.47	57.3 0.7	61.87 0.35	20.1 1.6	62.03 0.33	20.3 2.0
Dec. 7	38.41 0.46	56.6 0.3	62.22 0.34	18.5 1.4	62.36 0.33	18.3 2.0
17	38.87 0.43	56.3 0.2	62.56 0.33	17.1 1.2	62.69 0.32	16.3 1.9
27	39.30 0.38	56.5 0.6	62.89 0.29	15.9 0.9	63.01 0.29	14.4 1.6
37	39.68	57.1	63.18	15.0	63.30	12.8

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ Argus.		α URSE MAJORIS		δ LEONIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 10 ^m 39	[°] 58 ['] 57	^h 10 ^m 55	[°] 62 ['] 29	^h 11 ^m 6	[°] 21 ['] 16
Jan. 1	42.35 0.42	4.9 3.2	10.18 0.55	39.2 0.4	44.44 0.32	51.1 1.3
11	42.77 0.36	8.1 3.5	10.73 0.48	39.6 0.9	44.76 0.29	49.8 1.0
21	43.13 0.28	11.6 3.6	11.21 0.41	40.5 1.4	45.05 0.25	48.8 0.8
31	43.41 0.20	15.2 3.8	11.62 0.32	41.9 1.9	45.30 0.20	48.0 0.3
Feb. 10	43.61 0.13	19.0 3.8	11.94 0.23	43.8 2.2	45.50 0.15	47.7 0.0
20	43.74 0.05	22.8 3.7	12.17 0.13	46.0 2.4	45.65 0.11	47.7 0.4
March 2	43.79 0.02	26.5 3.5	12.30 0.04	48.4 2.6	45.76 0.06	48.1 0.6
12	43.77 0.08	30.0 3.3	12.34 0.06	51.0 2.6	45.82 0.01	48.7 0.8
22	43.69 0.15	33.3 3.1	12.28 0.14	53.6 2.5	45.83 0.03	49.5 0.9
April 1	43.54 0.20	36.4 2.7	12.14 0.21	56.1 2.3	45.80 0.05	50.4 1.0
11	43.34 0.23	39.1 2.2	11.93 0.26	58.4 2.1	45.75 0.08	51.4 1.1
21	43.11 0.27	41.3 1.8	11.67 0.30	60.5 1.7	45.67 0.10	52.5 1.0
May 1	42.84 0.29	43.1 1.4	11.37 0.34	62.2 1.3	45.57 0.11	53.5 0.9
11	42.55 0.30	44.5 0.8	11.03 0.35	63.5 0.9	45.46 0.12	54.4 0.9
21	42.25 0.30	45.3 0.4	10.68 0.36	64.4 0.3	45.34 0.13	55.3 0.7
31	41.95 0.30	45.7 0.1	10.32 0.34	64.7 0.2	45.21 0.12	56.0 0.5
June 10	41.65 0.30	45.6 0.6	9.98 0.32	64.5 0.6	45.09 0.11	56.5 0.4
20	41.35 0.28	45.0 1.1	9.66 0.29	63.9 1.0	44.98 0.09	56.9 0.2
30	41.07 0.25	43.9 1.5	9.37 0.25	62.9 1.5	44.89 0.06	57.1 0.0
July 10	40.82 0.21	42.4 2.0	9.12 0.21	61.4 1.9	44.81 0.07	57.1 0.3
20	40.61 0.18	40.4 2.4	8.91 0.16	59.5 2.3	44.74 0.05	56.9 0.4
30	40.43 0.13	38.0 2.6	8.75 0.11	57.2 2.6	44.69 0.03	56.5 0.6
Aug. 9	40.30 0.06	35.4 2.7	8.64 0.06	54.6 2.8	44.66 0.01	55.9 0.8
19	40.24 0.00	32.7 2.8	8.58 0.00	51.8 3.0	44.65 0.02	55.1 1.0
29	40.24 0.06	29.9 2.8	8.58 0.06	48.8 3.2	44.67 0.05	54.1 1.2
Sept. 8	40.30 0.14	27.1 2.6	8.66 0.14	45.6 3.3	44.72 0.08	52.9 1.4
18	40.44 0.21	24.5 2.4	8.80 0.20	42.3 3.5	44.80 0.12	51.5 1.7
28	40.65 0.28	22.1 2.0	9.00 0.28	38.8 3.4	44.92 0.16	49.8 1.9
Oct. 8	40.98 0.35	20.1 1.6	9.28 0.35	35.4 3.2	45.08 0.20	47.9 2.0
18	41.28 0.42	18.5 1.1	9.63 0.41	32.2 3.0	45.28 0.23	45.9 2.2
28	41.70 0.47	17.4 0.6	10.04 0.47	29.2 2.8	45.51 0.27	43.7 2.3
Nov. 7	42.17 0.50	16.8 0.1	10.51 0.52	26.4 2.4	45.78 0.30	41.4 2.2
17	42.67 0.53	16.9 0.8	11.03 0.56	24.0 2.1	46.08 0.33	39.2 2.2
27	43.20 0.54	17.7 1.4	11.59 0.59	21.9 1.7	46.41 0.35	37.0 2.1
Dec. 7	43.74 0.53	19.1 1.9	12.18 0.60	20.2 1.1	46.76 0.35	34.9 2.0
17	44.27 0.49	21.0 2.5	12.78 0.59	19.1 0.6	47.11 0.35	32.9 1.8
27	44.76 0.45	23.5 3.0	13.37 0.56	18.5 0.1	47.46 0.34	31.1 1.6
37	45.21	26.5	13.93	18.6	47.80	29.5

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Hydre et Crateris.		β LEONIS.		γ URSE MAJORIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 11 ^m 12	[°] 14 ['] 1	^h 11 ^m 41	[°] 15 ['] 20	^h 11 ^m 46	[°] 54 ['] 27
Jan. 1	25.03 0.31	39.7 2.5	59.45 0.32	43.2 1.7	32.08 0.48	39.6 0.6
11	25.34 0.28	42.2 2.4	59.77 0.30	41.5 1.4	32.56 0.44	39.0 0.1
21	25.62 0.24	44.6 2.3	60.07 0.28	40.1 1.1	33.00 0.41	39.1 0.6
31	25.86 0.19	46.9 2.2	60.35 0.23	39.0 0.8	33.41 0.34	39.7 1.2
Feb. 10	26.05 0.15	49.1 2.0	60.58 0.19	38.2 0.4	33.75 0.26	40.9 1.6
20	26.20 0.11	51.1 1.9	60.77 0.13	37.8 0.1	34.01 0.20	42.5 2.0
March 2	26.31 0.06	53.0 1.6	60.90 0.09	37.7 0.2	34.21 0.12	44.5 2.3
12	26.37 0.02	54.6 1.3	60.99 0.05	37.9 0.5	34.33 0.05	46.8 2.4
22	26.39 0.02	55.9 1.0	61.04 0.01	38.4 0.7	34.38 0.02	49.2 2.5
April 1	26.37 0.04	56.9 0.8	61.05 0.03	39.1 0.8	34.36 0.08	51.7 2.4
11	26.33 0.07	57.7 0.5	61.02 0.05	39.9 0.9	34.28 0.13	54.1 2.3
21	26.26 0.09	58.2 0.3	60.97 0.07	40.8 0.9	34.15 0.18	56.4 2.2
May 1	26.17 0.10	58.5 0.1	60.90 0.09	41.7 0.9	33.97 0.21	58.6 1.8
11	26.07 0.10	58.6 0.1	60.81 0.10	42.6 0.9	33.76 0.24	60.4 1.4
21	25.97 0.11	58.5 0.3	60.71 0.10	43.5 0.9	33.52 0.25	61.8 1.1
31	25.86 0.11	58.2 0.5	60.61 0.11	44.4 0.8	33.27 0.25	62.9 0.6
June 10	25.75 0.10	57.7 0.6	60.50 0.10	45.2 0.6	33.02 0.25	63.5 0.1
20	25.65 0.10	57.1 0.7	60.40 0.10	45.8 0.4	32.77 0.25	63.6 0.3
30	25.55 0.09	56.4 0.9	60.30 0.09	46.2 0.3	32.52 0.23	63.3 0.7
July 10	25.46 0.07	55.5 1.1	60.21 0.09	46.5 0.1	32.29 0.21	62.6 1.1
20	25.39 0.05	54.4 1.3	60.12 0.08	46.6 0.1	32.08 0.18	61.5 1.6
30	25.34 0.04	53.1 1.2	60.04 0.06	46.5 0.2	31.90 0.15	59.9 2.0
Aug. 9	25.30 0.02	51.9 1.0	59.98 0.04	46.3 0.5	31.75 0.11	57.9 2.3
19	25.28 0.01	50.9 0.9	59.94 0.01	45.8 0.7	31.64 0.07	55.6 2.6
29	25.29 0.04	50.0 0.8	59.93 0.01	45.1 0.8	31.57 0.03	53.0 2.8
Sept. 8	25.33 0.07	49.2 0.7	59.94 0.04	44.3 1.1	31.54 0.02	50.2 3.1
18	25.40 0.11	48.5 0.5	59.98 0.08	43.2 1.3	31.56 0.08	47.1 3.2
28	25.51 0.15	48.0 0.2	60.06 0.12	41.9 1.6	31.64 0.15	43.9 3.4
Oct. 8	25.66 0.19	47.8 0.2	60.18 0.16	40.3 1.8	31.79 0.20	40.5 3.4
18	25.85 0.24	48.0 0.6	60.34 0.20	38.5 2.0	31.99 0.26	37.1 3.3
28	26.09 0.27	48.6 1.0	60.54 0.23	36.5 2.1	32.25 0.32	33.8 3.2
Nov. 7	26.36 0.30	49.6 1.3	60.77 0.27	34.4 2.2	32.57 0.37	30.6 2.9
17	26.66 0.31	50.9 1.6	61.04 0.30	32.2 2.2	32.94 0.43	27.7 2.7
27	26.97 0.33	52.5 1.8	61.34 0.33	30.0 2.3	33.37 0.46	25.0 2.3
Dec. 7	27.30 0.35	54.3 2.2	61.67 0.34	27.7 2.2	33.83 0.47	22.7 1.9
17	27.65 0.33	56.5 2.3	62.01 0.34	25.5 2.1	34.30 0.49	20.8 1.4
27	27.98 0.32	58.8 2.5	62.35 0.33	23.4 1.9	34.79 0.49	19.4 0.8
37	28.30	61.3	62.68	21.5	35.28	18.6

after the 22d of March it begins at the Sidereal (h. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β Chamaeleontis.		α^1 Crucis.		β Corvi.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 12 ^m 10	[°] 78 ['] 32	^h 12 ^m 18	[°] 62 ['] 19	^h 12 ^m 27	[°] 22 ['] 37
Jan. 1	17.02 1.19	12.8 1.9	54.83 0.59	29.4 2.1	6.39 0.36	40.0 2.3
11	18.21 1.09	14.7 2.4	54.92 0.54	31.5 2.5	6.75 0.33	42.3 2.4
21	19.30 0.99	17.1 2.9	55.46 0.50	34.0 2.9	7.08 0.30	44.7 2.4
31	20.29 0.85	20.0 3.3	55.96 0.43	36.9 3.2	7.38 0.27	47.1 2.4
Feb. 10	21.14 0.68	23.3 3.5	56.39 0.35	40.1 3.4	7.65 0.23	49.5 2.3
20	21.82 0.51	26.8 3.8	56.74 0.28	43.5 3.5	7.88 0.18	51.8 2.2
March 2	22.33 0.36	30.6 3.9	57.02 0.20	47.0 3.6	8.06 0.14	54.0 2.0
12	22.69 0.19	34.5 3.8	57.22 0.13	50.6 3.5	8.20 0.10	56.0 1.8
22	22.88 0.01	38.3 3.8	57.35 0.07	54.1 3.5	8.30 0.07	57.8 1.5
April 1	22.89 0.15	42.1 3.7	57.42 0.00	57.6 3.3	8.37 0.03	59.3 1.3
11	22.74 0.29	45.8 3.4	57.42 0.07	60.9 3.0	8.40 0.00	60.6 1.1
21	22.45 0.43	49.2 3.1	57.35 0.12	63.9 2.6	8.40 0.02	61.7 0.9
May 1	22.02 0.55	52.3 2.8	57.23 0.17	66.5 2.3	8.38 0.05	62.6 0.6
11	21.47 0.66	55.1 2.4	57.06 0.22	68.8 1.9	8.33 0.07	63.2 0.4
21	20.81 0.75	57.5 1.9	56.84 0.26	70.7 1.5	8.26 0.08	63.6 0.2
31	20.06 0.83	59.4 1.4	56.58 0.28	72.2 1.1	8.18 0.10	63.8 0.0
June 10	19.23 0.88	60.8 0.9	56.30 0.30	73.3 0.6	8.08 0.10	63.8 0.3
20	18.35 0.90	61.7 0.3	56.00 0.32	73.9 0.1	7.98 0.11	63.5 0.5
30	17.45 0.91	62.0 0.3	55.68 0.33	74.0 0.4	7.87 0.11	63.0 0.7
July 10	16.54 0.88	61.7 0.8	55.35 0.32	73.6 0.9	7.76 0.11	62.3 0.9
20	15.66 0.83	60.9 1.2	55.03 0.31	72.7 1.3	7.65 0.11	61.4 0.9
30	14.83 0.74	59.7 1.7	54.72 0.28	71.4 1.6	7.54 0.10	60.5 1.1
Aug. 9	14.09 0.63	58.0 2.2	54.44 0.23	69.8 2.1	7.44 0.08	59.4 1.2
19	13.46 0.48	55.8 2.5	54.21 0.18	67.7 2.4	7.36 0.07	58.2 1.3
29	12.98 0.33	53.3 2.8	54.03 0.12	65.3 2.6	7.29 0.04	56.9 1.2
Sept. 8	12.65 0.15	50.5 3.0	53.91 0.05	62.7 2.7	7.25 0.00	55.7 1.1
18	12.50 0.05	47.5 3.1	53.86 0.03	60.0 2.7	7.25 0.04	54.6 0.9
28	12.55 0.27	44.4 3.0	53.89 0.13	57.3 2.6	7.29 0.08	53.7 0.8
Oct. 8	12.82 0.47	41.4 2.7	54.02 0.23	54.7 2.4	7.37 0.13	52.9 0.5
18	13.29 0.67	38.7 2.4	54.25 0.31	52.3 2.1	7.50 0.17	52.4 0.1
28	13.96 0.84	36.3 2.1	54.56 0.39	50.2 1.6	7.67 0.22	52.3 0.2
Nov. 7	14.80 0.99	34.2 1.6	54.95 0.46	48.6 1.1	7.89 0.26	52.5 0.6
17	15.79 1.14	32.6 1.0	55.41 0.53	47.5 0.7	8.15 0.30	53.1 1.0
27	16.93 1.23	31.6 0.4	55.94 0.57	46.8 0.0	8.45 0.34	54.1 1.3
Dec. 7	18.16 1.25	31.2 0.3	56.51 0.60	46.8 0.6	8.79 0.35	55.4 1.7
17	19.41 1.26	31.5 0.9	57.11 0.61	47.4 1.3	9.14 0.34	57.1 1.9
27	20.67 1.23	32.4 1.6	57.72 0.60	48.7 1.8	9.48 0.35	59.0 2.2
37	21.90	34.0	58.32	50.5	9.83	61.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	12 Canum Venaticorum.		α VIRGINIS. (Spica.)		γ URSAE MAJORIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 12 ^m 49	[°] 39 ['] 3	^h 13 ^m 17	[°] 10 ['] 26	^h 13 ^m 42	[°] 49 ['] 59
Jan. 1	32.21 0.40	50.1 1.5	53.20 0.33	10.9 2.0	4.03 0.43	65.7 1.9
11	32.61 0.38	48.6 1.1	53.55 0.33	12.9 2.0	4.46 0.44	63.8 1.3
21	32.99 0.35	47.5 0.6	53.88 0.31	14.9 2.0	4.90 0.43	62.5 0.7
31	33.34 0.32	46.9 0.0	54.19 0.28	16.9 1.9	5.33 0.40	61.8 0.1
Feb. 10	33.66 0.28	46.9 0.5	54.47 0.26	18.8 1.7	5.73 0.37	61.7 0.5
20	33.94 0.23	47.4 1.0	54.73 0.23	20.5 1.4	6.10 0.33	62.2 1.1
March 2	34.17 0.19	48.4 1.4	54.96 0.19	21.9 1.2	6.43 0.27	63.3 1.6
12	34.36 0.13	49.8 1.7	55.15 0.15	23.1 1.0	6.70 0.21	64.9 2.0
22	34.49 0.07	51.5 2.0	55.30 0.11	24.1 0.9	6.91 0.15	66.9 2.4
April 1	34.56 0.02	53.5 2.1	55.41 0.08	25.0 0.6	7.06 0.09	69.3 2.6
11	34.58 0.01	55.6 2.2	55.49 0.05	25.6 0.4	7.15 0.04	71.9 2.7
21	34.57 0.04	57.8 2.2	55.54 0.03	26.0 0.1	7.19 0.02	74.6 2.7
May 1	34.53 0.07	60.0 2.1	55.57 0.00	26.1 0.0	7.17 0.05	77.3 2.6
11	34.46 0.11	62.1 1.8	55.57 0.02	26.1 0.1	7.12 0.09	79.9 2.4
21	34.35 0.15	63.9 1.5	55.55 0.04	26.0 0.3	7.03 0.14	82.3 2.3
31	34.20 0.15	65.4 1.2	55.51 0.06	25.7 0.4	6.89 0.18	84.6 1.9
June 10	34.05 0.16	66.6 1.0	55.45 0.08	25.3 0.4	6.71 0.21	86.5 1.5
20	33.89 0.16	67.6 0.7	55.37 0.09	24.9 0.5	6.50 0.22	88.0 1.0
30	33.73 0.17	68.3 0.3	55.28 0.10	24.4 0.6	6.28 0.24	89.0 0.6
July 10	33.56 0.17	68.6 0.1	55.18 0.11	23.8 0.6	6.04 0.24	89.6 0.2
20	33.39 0.16	68.5 0.6	55.07 0.11	23.2 0.7	5.80 0.25	89.8 0.3
30	33.23 0.15	67.9 1.0	54.96 0.11	22.5 0.7	5.55 0.25	89.5 0.7
Aug. 9	33.08 0.13	66.9 1.3	54.85 0.10	21.8 0.6	5.30 0.23	88.8 1.2
19	32.95 0.12	65.6 1.6	54.75 0.10	21.2 0.6	5.07 0.22	87.6 1.6
29	32.83 0.09	64.0 1.9	54.65 0.08	20.6 0.5	4.85 0.19	86.0 1.9
Sept. 8	32.74 0.05	62.1 2.2	54.57 0.04	20.1 0.4	4.66 0.16	84.1 2.4
18	32.69 0.01	59.9 2.5	54.53 0.01	19.7 0.3	4.50 0.11	81.7 2.8
28	32.68 0.03	57.4 2.7	54.52 0.02	19.4 0.1	4.39 0.06	78.9 3.1
Oct. 8	32.71 0.09	54.7 2.9	54.54 0.06	19.3 0.3	4.33 0.01	75.8 3.2
18	32.80 0.14	51.8 3.1	54.60 0.12	19.6 0.4	4.32 0.05	72.6 3.4
28	32.94 0.19	48.7 3.2	54.72 0.17	20.0 0.8	4.37 0.12	69.2 3.5
Nov. 7	33.13 0.23	45.5 3.1	54.89 0.21	20.8 1.0	4.49 0.19	65.7 3.6
17	33.36 0.29	42.4 3.0	55.10 0.25	21.8 1.3	4.68 0.25	62.1 3.5
27	33.65 0.33	39.4 2.8	55.35 0.28	23.1 1.6	4.93 0.30	58.6 3.3
Dec. 7	33.98 0.35	36.6 2.6	55.63 0.31	24.7 1.7	5.23 0.35	55.3 2.9
17	34.33 0.38	34.0 2.3	55.94 0.33	26.4 1.9	5.58 0.40	52.4 2.6
27	34.71 0.40	31.7 1.8	56.27 0.34	28.3 2.0	5.98 0.43	49.8 2.2
37	35.11	29.9	56.61	30.3	6.41	47.6

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	γ Bootis.		β Centauri.		α Bootis. (Arcturus).	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 13 ^m 48	[°] 19 ['] 5	^h 13 ^m 54	[°] 59 ['] 41	^h 14 ^m 9	[°] 19 ['] 53
Jan. 1	4.59 0.34	30.3 2.2	3.07 0.58	51.9 0.8	19.76 0.33	72.5 2.3
11	4.93 0.34	28.1 1.8	3.65 0.58	52.7 1.3	20.09 0.34	70.2 1.9
21	5.27 0.33	26.3 1.5	4.23 0.56	54.0 1.8	20.43 0.33	68.3 1.6
31	5.60 0.31	24.8 1.1	4.79 0.53	55.8 2.1	20.76 0.31	66.7 1.1
Feb. 10	5.91 0.28	23.7 0.6	5.32 0.49	57.9 2.5	21.07 0.28	65.6 0.7
20	6.19 0.24	23.1 0.1	5.81 0.45	60.4 2.7	21.35 0.25	64.9 0.3
March 2	6.43 0.21	23.0 0.2	6.26 0.38	63.1 2.9	21.60 0.23	64.6 0.2
12	6.64 0.18	23.2 0.6	6.64 0.32	66.0 3.0	21.83 0.20	64.8 0.6
22	6.82 0.14	23.8 1.0	6.96 0.27	69.0 3.0	22.03 0.17	65.4 0.9
April 1	6.96 0.11	24.8 1.3	7.23 0.21	72.0 3.0	22.20 0.13	66.3 1.2
11	7.07 0.07	26.1 1.4	7.44 0.14	75.0 2.9	22.33 0.09	67.5 1.4
21	7.14 0.03	27.5 1.5	7.58 0.09	77.9 2.8	22.42 0.04	68.9 1.6
May 1	7.17 0.01	29.0 1.6	7.67 0.03	80.7 2.6	22.46 0.02	70.5 1.6
11	7.18 0.01	30.6 1.5	7.70 0.03	83.3 2.4	22.48 0.00	72.1 1.6
21	7.17 0.05	32.1 1.5	7.67 0.09	85.7 2.1	22.48 0.02	73.7 1.6
31	7.12 0.06	33.6 1.4	7.58 0.14	87.8 1.8	22.46 0.05	75.3 1.5
June 10	7.06 0.08	35.0 1.2	7.44 0.18	89.6 1.4	22.41 0.08	76.8 1.3
20	6.98 0.11	36.2 1.0	7.26 0.21	91.0 1.1	22.33 0.10	78.1 1.2
30	6.87 0.12	37.2 0.8	7.05 0.25	92.1 0.6	22.23 0.12	79.3 0.9
July 10	6.75 0.13	38.0 0.6	6.80 0.28	92.7 0.1	22.11 0.13	80.2 0.6
20	6.62 0.13	38.6 0.3	6.52 0.30	92.8 0.3	21.98 0.14	80.8 0.4
30	6.49 0.14	38.9 0.0	6.22 0.31	92.5 0.8	21.84 0.15	81.2 0.1
Aug. 9	6.35 0.13	38.9 0.2	5.91 0.30	91.7 1.2	21.69 0.15	81.3 0.2
19	6.22 0.12	38.7 0.5	5.61 0.28	90.5 1.6	21.54 0.14	81.1 0.4
29	6.10 0.11	38.2 0.8	5.33 0.24	88.9 1.8	21.40 0.13	80.7 0.7
Sept. 8	5.99 0.09	37.4 1.0	5.09 0.18	87.1 2.1	21.27 0.10	80.0 1.0
18	5.90 0.05	36.4 1.3	4.91 0.13	85.0 2.4	21.17 0.08	79.0 1.5
28	5.85 0.01	35.1 1.6	4.78 0.05	82.6 2.5	21.09 0.04	77.5 1.8
Oct. 8	5.84 0.02	33.5 1.9	4.73 0.03	80.1 2.4	21.05 0.01	75.7 1.9
18	5.86 0.06	31.6 2.2	4.76 0.13	77.7 2.4	21.04 0.04	73.8 2.1
28	5.92 0.11	29.4 2.4	4.89 0.22	75.3 2.2	21.06 0.09	71.7 2.3
Nov. 7	6.03 0.17	27.0 2.5	5.11 0.30	73.1 1.8	21.17 0.15	69.4 2.5
17	6.20 0.22	24.5 2.6	5.41 0.37	71.3 1.3	21.32 0.19	66.9 2.7
27	6.42 0.25	21.9 2.6	5.78 0.44	70.0 1.0	21.51 0.23	64.2 2.8
Dec. 7	6.67 0.29	19.3 2.6	6.22 0.51	69.0 0.6	21.74 0.27	61.4 2.7
17	6.96 0.32	16.7 2.5	6.73 0.55	68.4 0.0	22.01 0.30	58.7 2.6
27	7.28 0.33	14.2 2.3	7.28 0.58	68.4 0.6	22.31 0.33	56.1 2.4
37	7.61	11.9	7.86	69.0	22.64	53.7

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Centauri.		β Bootis.		α Libræ.	
	Right Ascension.	Dec. South.	Right Ascension	Dec. North.	Right Ascension.	Dec. South.
	^h 14 ^m 30	60° 15'	^h 14 ^m 38	27° 39'	^h 14 ^m 43	15° 27'
Jan. 1	11.96 0.58	16.0 0.3	55.15 0.34	26.3 2.4	11.95 0.34	46.7 1.5
11	12.54 0.57	16.3 0.8	55.49 0.34	23.9 2.0	12.29 0.34	48.2 1.6
21	13.11 0.58	17.1 1.2	55.83 0.35	21.9 1.5	12.63 0.34	49.8 1.7
31	13.69 0.56	18.3 1.6	56.18 0.33	20.4 1.1	12.97 0.33	51.5 1.6
Feb. 10	14.25 0.53	19.9 1.9	56.51 0.32	19.3 0.5	13.30 0.31	53.1 1.5
20	14.78 0.49	21.8 2.2	56.83 0.28	18.8 0.1	13.61 0.29	54.6 1.4
March 2	15.27 0.43	24.0 2.5	57.11 0.26	18.7 0.4	13.90 0.26	56.0 1.2
12	15.70 0.38	26.5 2.7	57.37 0.23	19.1 0.9	14.16 0.23	57.2 1.0
22	16.08 0.33	29.2 2.8	57.60 0.19	20.0 1.3	14.39 0.19	58.2 0.8
April 1	16.41 0.27	32.0 2.9	57.79 0.16	21.3 1.6	14.58 0.17	59.0 0.6
11	16.68 0.21	34.9 2.8	57.95 0.12	22.9 1.9	14.75 0.15	59.6 0.5
21	16.89 0.16	37.7 2.7	58.07 0.08	24.8 2.1	14.90 0.12	60.1 0.3
May 1	17.05 0.10	40.4 2.6	58.15 0.05	26.9 2.1	15.02 0.09	60.4 0.2
11	17.15 0.03	43.0 2.5	58.20 0.02	29.0 2.1	15.11 0.06	60.6 0.0
21	17.18 0.04	45.5 2.2	58.22 0.02	31.1 2.1	15.17 0.02	60.6 0.0
31	17.14 0.10	47.7 2.0	58.20 0.04	33.2 1.9	15.19 0.00	60.6 0.1
June 10	17.04 0.15	49.7 1.7	58.16 0.07	35.1 1.7	15.19 0.03	60.5 0.2
20	16.89 0.19	51.4 1.3	58.09 0.11	36.8 1.6	15.16 0.05	60.3 0.3
30	16.70 0.24	52.7 0.9	57.98 0.13	38.4 1.3	15.11 0.08	60.0 0.4
July 10	16.46 0.28	53.6 0.5	57.85 0.15	39.7 0.9	15.03 0.10	59.6 0.4
20	16.18 0.32	54.1 0.1	57.70 0.16	40.6 0.5	14.93 0.12	59.2 0.5
30	15.86 0.33	54.2 0.4	57.54 0.17	41.1 0.2	14.81 0.14	58.7 0.5
Aug. 9	15.53 0.33	53.8 0.8	57.37 0.17	41.3 0.1	14.67 0.14	58.2 0.6
19	15.20 0.32	53.0 1.3	57.20 0.16	41.2 0.4	14.53 0.14	57.6 0.6
29	14.88 0.29	51.7 1.7	57.04 0.15	40.8 0.8	14.39 0.13	57.0 0.6
Sept. 8	14.59 0.26	50.0 1.9	56.89 0.14	40.0 1.1	14.26 0.11	56.4 0.5
18	14.33 0.21	48.1 2.2	56.75 0.12	38.9 1.6	14.15 0.09	55.9 0.5
28	14.12 0.13	45.9 2.3	56.63 0.09	37.3 1.9	14.06 0.06	55.4 0.3
Oct. 8	13.99 0.05	43.6 2.4	56.54 0.04	35.4 2.2	14.00 0.01	55.1 0.2
18	13.94 0.05	41.2 2.4	56.50 0.01	33.2 2.4	13.99 0.03	54.9 0.0
28	13.99 0.14	38.8 2.3	56.51 0.05	30.8 2.5	14.02 0.07	54.9 0.2
Nov. 7	14.13 0.23	36.5 2.0	56.56 0.11	28.3 2.8	14.09 0.13	55.1 0.4
17	14.36 0.31	34.5 1.8	56.67 0.16	25.5 3.0	14.22 0.19	55.5 0.7
27	14.67 0.39	32.7 1.4	56.83 0.21	22.5 2.9	14.41 0.23	56.2 1.0
Dec. 7	15.06 0.47	31.3 0.9	57.04 0.25	19.6 2.9	14.64 0.26	57.2 1.2
17	15.53 0.52	30.4 0.5	57.29 0.29	16.7 2.8	14.90 0.30	58.4 1.3
27	16.05 0.57	29.9 0.0	57.58 0.32	13.9 2.5	15.20 0.33	59.7 1.5
37	16.62	29.9	57.90	11.4	15.53	61.2

after the 23d of March it begins at the Sidereal On. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β URSE MINORIS.		β LIBRÆ.		α CORONÆ BOREALIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 14 ^m 51	74° 42'	^h 15 ^m 9	8° 52'	^h 15 ^m 28	27° 10'
Jan. 1	6.73 0.77	59.9 2.3	32.04 0.32	8.6 1.6	48.08 0.31	49.7 2.6
11	7.50 0.84	57.6 1.7	32.36 0.33	10.2 1.6	48.39 0.32	47.1 2.2
21	8.34 0.87	55.9 1.0	32.69 0.33	11.8 1.6	48.71 0.33	44.9 1.7
31	9.21 0.88	54.9 0.3	33.02 0.32	13.4 1.5	49.04 0.34	43.2 1.4
Feb. 10	10.09 0.87	54.6 0.3	33.34 0.30	14.9 1.2	49.38 0.32	41.8 0.9
20	10.96 0.81	54.9 1.0	33.64 0.30	16.1 1.1	49.70 0.31	40.9 0.3
March 2	11.77 0.72	55.9 1.6	33.94 0.27	17.2 0.9	50.01 0.29	40.6 0.2
12	12.49 0.61	57.5 2.2	34.21 0.24	18.1 0.7	50.30 0.26	40.8 0.7
22	13.10 0.48	59.7 2.6	34.45 0.22	18.8 0.4	50.56 0.23	41.5 1.1
April 1	13.58 0.36	62.3 2.9	34.67 0.19	19.2 0.1	50.79 0.21	42.6 1.6
11	13.94 0.21	65.2 3.1	34.86 0.16	19.3 0.0	51.00 0.17	44.1 1.9
21	14.15 0.07	68.3 3.2	35.02 0.14	19.3 0.1	51.17 0.13	46.0 2.1
May 1	14.22 0.07	71.5 3.2	35.16 0.11	19.2 0.3	51.30 0.10	48.1 2.2
11	14.15 0.21	74.7 3.0	35.27 0.08	18.9 0.4	51.40 0.07	50.3 2.3
21	13.94 0.35	77.7 2.9	35.35 0.05	18.5 0.4	51.47 0.03	52.6 2.3
31	13.59 0.46	80.6 2.6	35.40 0.02	18.1 0.5	51.50 0.00	54.9 2.2
June 10	13.13 0.55	83.2 2.1	35.42 0.01	17.6 0.5	51.50 0.03	57.1 2.0
20	12.58 0.63	85.3 1.7	35.41 0.04	17.1 0.6	51.47 0.07	59.1 1.9
30	11.95 0.71	87.0 1.2	35.37 0.07	16.5 0.6	51.40 0.10	61.0 1.6
July 10	11.24 0.76	88.2 0.7	35.30 0.09	15.9 0.6	51.30 0.13	62.6 1.3
20	10.48 0.80	88.9 0.2	35.21 0.11	15.3 0.5	51.17 0.15	63.9 1.0
30	9.68 0.81	89.1 0.3	35.10 0.13	14.8 0.5	51.02 0.17	64.9 0.7
Aug. 9	8.87 0.80	88.8 0.9	34.97 0.14	14.3 0.5	50.85 0.18	65.6 0.2
19	8.07 0.80	87.9 1.4	34.83 0.15	13.8 0.4	50.67 0.19	65.8 0.1
29	7.27 0.76	86.5 1.8	34.68 0.14	13.4 0.3	50.48 0.19	65.7 0.5
Sept. 8	6.51 0.69	84.7 2.3	34.54 0.13	13.1 0.3	50.29 0.17	65.2 0.7
18	5.82 0.61	82.4 2.7	34.41 0.11	12.8 0.2	50.12 0.16	64.5 1.1
28	5.21 0.51	79.7 3.1	34.30 0.08	12.6 0.0	49.96 0.13	63.4 1.5
Oct. 8	4.70 0.40	76.6 3.4	34.22 0.04	12.6 0.2	49.83 0.09	61.9 1.9
18	4.30 0.27	73.2 3.6	34.18 0.01	12.8 0.3	49.74 0.05	60.0 2.3
28	4.03 0.13	69.6 3.8	34.19 0.04	13.1 0.5	49.69 0.00	57.7 2.5
Nov. 7	3.90 0.02	65.8 3.7	34.23 0.10	13.6 0.8	49.69 0.05	55.2 2.6
17	3.92 0.18	62.1 3.8	34.33 0.16	14.4 1.1	49.74 0.10	52.6 2.8
27	4.10 0.32	58.3 3.6	34.49 0.20	15.5 1.2	49.84 0.16	49.8 2.9
Dec. 7	4.42 0.47	54.7 3.4	34.69 0.24	16.7 1.2	50.00 0.21	46.9 2.9
17	4.89 0.60	51.3 3.1	34.93 0.27	17.9 1.5	50.21 0.25	44.0 2.9
27	5.49 0.71	48.2 2.5	35.20 0.30	19.4 1.7	50.46 0.29	41.1 2.7
37	6.20	45.7	35.50	21.1	50.75	38.4

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh., after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α SERPENTIS.		ζ URSAE MINORIS.		β^1 SCORPII.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 15 ^m 37	[°] 6 ['] 51	^h 15 ^m 48	[°] 78 ['] 12	^h 15 ^m 57	[°] 19 ['] 25
Jan. 1	25.39 0.30	45.1 2.1	61.13 0.78	52.7 2.8	21.56 0.31	21.5 1.0
11	25.69 0.30	43.0 1.9	61.91 0.91	49.9 2.9	21.87 0.32	22.5 1.1
21	25.99 0.31	41.1 1.6	62.82 1.01	47.7 1.7	22.19 0.34	23.6 1.1
31	26.30 0.31	39.5 1.4	63.83 1.08	46.0 1.0	22.53 0.34	24.7 1.1
Feb. 10	26.61 0.31	38.1 1.1	64.91 1.12	45.0 0.4	22.87 0.33	25.8 1.1
20	26.92 0.30	37.0 0.8	66.03 1.08	44.6 0.3	23.20 0.32	26.9 1.0
March 2	27.22 0.28	36.2 0.4	67.11 1.00	44.9 1.0	23.52 0.31	27.9 0.9
12	27.50 0.25	35.8 0.0	68.11 0.92	45.9 1.6	23.88 0.28	28.8 0.8
22	27.75 0.23	35.8 0.4	69.08 0.84	47.5 2.1	24.11 0.27	29.6 0.6
April 1	27.98 0.21	36.2 0.7	69.87 0.67	49.6 2.6	24.38 0.25	30.2 0.5
11	28.19 0.18	36.9 0.9	70.54 0.50	52.2 2.9	24.63 0.22	30.7 0.4
21	28.37 0.15	37.8 1.0	71.04 0.33	55.1 3.1	24.85 0.19	31.1 0.2
May 1	28.52 0.12	38.8 1.2	71.37 0.14	58.2 3.2	25.04 0.16	31.3 0.2
11	28.64 0.09	40.0 1.3	71.51 0.05	61.4 3.3	25.20 0.13	31.5 0.1
21	28.73 0.07	41.3 1.5	71.46 0.26	64.7 3.2	25.33 0.10	31.6 0.1
31	28.80 0.03	42.8 1.5	71.20 0.42	67.9 2.9	25.48 0.07	31.7 0.0
June 10	28.83 0.00	44.3 1.3	70.78 0.56	70.8 2.7	25.50 0.03	31.7 0.1
20	28.83 0.03	45.6 1.2	70.22 0.70	73.5 2.4	25.53 0.00	31.6 0.1
30	28.80 0.06	46.8 1.1	69.52 0.84	75.9 1.9	25.53 0.03	31.5 0.2
July 10	28.74 0.09	47.9 1.0	68.68 0.94	77.8 1.5	25.50 0.07	31.3 0.2
20	28.65 0.11	48.9 0.8	67.74 1.03	79.3 1.0	25.43 0.10	31.1 0.2
30	28.54 0.13	49.7 0.6	66.71 1.00	80.3 0.5	25.33 0.13	30.9 0.3
Aug. 9	28.41 0.15	50.3 0.5	65.62 1.12	80.8 0.0	25.20 0.15	30.6 0.3
19	28.26 0.16	50.8 0.3	64.50 1.14	80.8 0.6	25.05 0.16	30.3 0.4
29	28.10 0.16	51.1 0.0	63.36 1.12	80.2 1.1	24.89 0.16	29.9 0.4
Sept. 8	27.94 0.14	51.1 0.2	62.24 1.07	79.1 1.5	24.73 0.15	29.5 0.5
18	27.80 0.13	50.9 0.4	61.17 1.02	77.6 2.0	24.58 0.15	29.0 0.5
28	27.67 0.10	50.5 0.7	60.15 0.92	75.6 2.4	24.43 0.12	28.5 0.4
Oct. 8	27.57 0.07	49.8 0.9	59.23 0.79	73.2 2.8	24.31 0.08	28.1 0.4
18	27.50 0.04	48.9 1.1	58.44 0.65	70.4 3.2	24.23 0.04	27.7 0.3
28	27.46 0.01	47.8 1.4	57.79 0.47	67.2 3.5	24.19 0.01	27.4 0.2
Nov. 7	27.47 0.06	46.4 1.6	57.32 0.28	63.7 3.6	24.20 0.05	27.2 0.0
17	27.53 0.11	44.8 1.9	57.04 0.10	60.1 3.7	24.25 0.12	27.2 0.2
27	27.64 0.17	42.9 2.0	56.94 0.10	56.4 3.6	24.37 0.17	27.4 0.4
Dec. 7	27.81 0.20	40.9 2.1	57.04 0.30	52.8 3.5	24.54 0.20	27.8 0.6
17	28.01 0.24	38.8 2.1	57.34 0.50	49.3 3.4	24.74 0.25	28.4 0.7
27	28.25 0.28	36.7 2.2	57.84 0.68	45.9 3.0	24.99 0.30	29.1 0.9
37	28.53	34.5	58.52	42.9	25.29	30.0

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	♐ OPHIUCHI.		♏ SCORPII. (Antares.)		♑ Draconis.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 16 ^m 7	3° 20'	^h 16 ^m 20	26° 7'	^h 16 ^m 22	61° 49'
Jan. 1	3.76 0.27	7.1 1.6	53.28 0.30	14.6 0.6	5.46 0.35	30.0 3.2
11	4.03 0.30	8.7 1.6	53.58 0.33	15.2 0.6	5.81 0.42	26.8 2.7
21	4.33 0.31	10.3 1.5	53.91 0.35	15.8 0.7	6.23 0.47	24.1 2.1
31	4.64 0.31	11.8 1.3	54.26 0.35	16.5 0.8	6.70 0.50	22.0 1.6
Feb. 10	4.95 0.31	13.1 1.1	54.61 0.35	17.3 0.8	7.20 0.52	20.4 1.0
20	5.26 0.31	14.2 0.8	54.96 0.34	18.1 0.8	7.72 0.52	19.4 0.3
March 2	5.57 0.29	15.0 0.5	55.30 0.33	18.9 0.8	8.24 0.50	19.1 0.4
12	5.86 0.28	15.5 0.3	55.63 0.31	19.7 0.8	8.74 0.46	19.5 1.1
22	6.14 0.25	15.8 0.1	55.94 0.30	20.5 0.7	9.20 0.43	20.6 1.6
April 1	6.39 0.23	15.9 0.2	56.24 0.28	21.2 0.7	9.63 0.38	22.2 2.2
11	6.62 0.21	15.7 0.5	56.52 0.25	21.9 0.6	10.01 0.33	24.4 2.6
21	6.83 0.18	15.2 0.7	56.77 0.22	22.5 0.5	10.34 0.26	27.0 3.0
May 1	7.01 0.16	14.5 0.8	56.99 0.20	23.0 0.4	10.60 0.18	30.3 3.2
11	7.17 0.13	13.7 0.8	57.19 0.17	23.4 0.4	10.78 0.10	33.2 3.3
21	7.30 0.09	12.9 0.9	57.36 0.13	23.6 0.4	10.88 0.03	36.4 3.3
31	7.39 0.07	12.0 1.0	57.49 0.09	24.2 0.3	10.91 0.04	39.7 3.3
June 10	7.46 0.04	11.0 0.9	57.56 0.06	24.5 0.3	10.87 0.12	42.9 3.0
20	7.50 0.00	10.1 0.9	57.64 0.02	24.8 0.3	10.75 0.20	45.9 2.9
30	7.50 0.04	9.2 0.8	57.66 0.01	25.1 0.2	10.55 0.26	48.8 2.6
July 10	7.46 0.07	8.4 0.8	57.65 0.06	25.3 0.1	10.29 0.31	51.4 2.1
20	7.39 0.09	7.6 0.7	57.59 0.10	25.4 0.0	9.96 0.35	53.5 1.5
30	7.30 0.12	6.9 0.6	57.49 0.13	25.4 0.1	9.63 0.39	55.0 1.0
Aug. 9	7.18 0.14	6.3 0.5	57.36 0.15	25.3 0.2	9.24 0.43	56.0 0.6
19	7.04 0.15	5.8 0.3	57.21 0.17	25.1 0.3	8.81 0.46	56.6 0.2
29	6.89 0.16	5.5 0.2	57.04 0.18	24.8 0.4	8.35 0.47	56.8 0.2
Sept. 8	6.73 0.15	5.3 0.2	56.86 0.17	24.4 0.5	7.88 0.45	56.6 0.2
18	6.58 0.15	5.1 0.0	56.69 0.16	23.9 0.5	7.43 0.44	55.8 1.5
28	6.43 0.12	5.1 0.2	56.53 0.14	23.4 0.6	6.99 0.40	54.3 2.0
Oct. 8	6.31 0.09	5.3 0.4	56.39 0.11	22.8 0.6	6.59 0.35	52.8 2.3
18	6.22 0.05	5.7 0.6	56.28 0.06	22.2 0.7	6.24 0.29	50.0 2.7
28	6.17 0.00	6.3 0.8	56.22 0.01	21.5 0.6	5.95 0.22	47.3 3.0
Nov. 7	6.17 0.04	7.1 0.9	56.21 0.04	20.9 0.4	5.73 0.14	44.3 3.4
17	6.21 0.10	8.0 1.1	56.25 0.09	20.5 0.3	5.59 0.03	40.9 3.6
27	6.31 0.14	9.1 1.3	56.34 0.15	20.2 0.2	5.56 0.06	37.3 3.7
Dec. 7	6.45 0.18	10.4 1.4	56.49 0.20	20.0 0.0	5.62 0.13	33.6 3.7
17	6.63 0.23	11.8 1.6	56.69 0.24	20.0 0.3	5.75 0.22	29.9 3.6
27	6.86 0.26	13.4 1.6	56.93 0.29	20.3 0.5	5.97 0.32	26.3 3.3
37	7.12	15.0	57.22	20.8	6.29	23.0

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal 0h. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.		α Herculis.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 16 ^m 33	[°] 68 ['] 45	^h 17 ^m 0	[°] 82 ['] 15	^h 17 ^m 8	[°] 14 ['] 32
Jan. 1	57.75 0.68	58.4 1.6	9.89 0.68	22.0 3.2	18.22 0.23	56.8 2.2
11	58.37 0.69	51.8 1.3	10.57 0.96	18.8 2.8	18.45 0.25	54.6 2.1
21	59.06 0.75	50.6 0.8	11.52 1.20	16.0 2.3	18.70 0.27	52.5 1.8
31	59.81 0.77	49.8 0.3	12.72 1.40	13.7 1.8	18.97 0.29	50.7 1.6
Feb. 10	60.58 0.78	49.5 0.0	14.12 1.54	11.9 1.2	19.26 0.30	49.1 1.2
20	61.26 0.79	49.5 0.4	15.66 1.61	10.7 0.7	19.56 0.30	47.9 0.8
March 2	62.15 0.77	49.9 0.8	17.27 1.60	10.0 0.0	19.86 0.30	47.1 0.4
12	62.92 0.74	50.7 1.2	18.87 1.55	10.0 0.7	20.16 0.29	46.7 0.1
22	63.66 0.70	51.9 1.6	20.42 1.46	10.7 1.4	20.45 0.28	46.8 0.5
April 1	64.36 0.66	53.5 1.9	21.88 1.32	12.1 1.9	20.73 0.27	47.3 0.9
11	65.02 0.59	55.4 2.0	23.20 1.12	14.0 2.3	21.00 0.24	48.2 1.3
21	65.61 0.52	57.4 2.2	24.32 0.88	16.3 2.8	21.24 0.23	49.5 1.6
May 1	66.13 0.43	59.6 2.4	25.20 0.62	19.1 3.1	21.47 0.20	51.1 1.8
11	66.56 0.36	62.0 2.5	25.82 0.34	22.2 3.2	21.67 0.17	52.9 1.9
21	66.92 0.27	64.5 2.6	26.16 0.05	25.4 3.3	21.84 0.14	54.8 2.0
31	67.19 0.18	67.1 2.6	26.21 0.23	28.7 3.3	21.98 0.11	56.8 2.1
June 10	67.37 0.08	69.7 2.4	25.98 0.50	32.0 3.1	22.09 0.08	58.9 2.0
20	67.45 0.03	72.1 2.3	25.48 0.75	35.1 3.0	22.17 0.03	60.9 2.0
30	67.42 0.13	74.4 2.1	24.73 1.00	38.1 2.7	22.20 0.00	62.9 1.8
July 10	67.29 0.22	76.5 1.9	23.73 1.21	40.8 2.3	22.20 0.05	64.7 1.6
20	67.07 0.30	78.4 1.6	22.52 1.41	43.1 2.0	22.15 0.08	66.3 1.5
30	66.77 0.36	80.0 1.1	21.11 1.58	45.1 1.5	22.07 0.11	67.8 1.2
Aug. 9	66.41 0.43	81.1 0.7	19.53 1.68	46.6 1.0	21.96 0.14	69.0 0.9
19	65.98 0.48	81.8 0.3	17.85 1.77	47.6 0.5	21.82 0.17	69.9 0.6
29	65.50 0.50	82.1 0.2	16.08 1.83	48.1 0.1	21.65 0.18	70.5 0.4
Sept. 8	65.00 0.50	81.9 0.7	14.25 1.83	48.2 0.5	21.47 0.18	70.9 0.1
18	64.50 0.48	81.2 1.2	12.42 1.82	47.7 0.9	21.29 0.19	71.0 0.3
28	64.02 0.41	80.0 1.7	10.60 1.73	46.8 1.4	21.10 0.17	70.7 0.5
Oct. 8	63.61 0.34	78.3 2.0	8.87 1.59	45.4 1.8	20.93 0.14	70.2 0.8
18	63.27 0.25	76.3 2.2	7.28 1.43	43.6 2.5	20.79 0.11	69.4 1.2
28	63.02 0.14	74.1 2.4	5.85 1.22	41.1 2.9	20.68 0.08	68.2 1.4
Nov. 7	62.88 0.01	71.7 2.6	4.63 0.99	38.2 3.0	20.60 0.03	66.8 1.7
17	62.87 0.11	69.1 2.7	3.64 0.75	35.2 3.2	20.57 0.01	65.1 1.9
27	62.98 0.23	66.4 2.6	2.89 0.46	32.0 3.4	20.58 0.05	63.2 2.1
Dec. 7	63.21 0.36	63.8 2.4	2.43 0.11	28.6 3.5	20.63 0.11	61.1 2.2
17	63.57 0.47	61.4 2.1	2.32 0.23	25.1 3.5	20.74 0.17	58.9 2.3
27	64.04 0.58	59.3 1.8	2.55 0.53	21.6 3.3	20.91 0.20	56.6 2.3
37	64.62	57.5	3.08	18.3	21.11	54.3

after the 22d of March it begins at the Sidereal Op. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT, AT WASHINGTON.

Sidereal Day of the Month.	β DRACONIS.		α OPHIOCHI.		σ OCTANTIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 17 ^m 27	[°] 52 ['] 28	^h 17 ^m 28	[°] 12 ['] 39	^h 17	[°] 89 ['] 16
Jan. 1	15.97 0.21	69.9 3.3	28.56 0.21	43.7 2.2	48 47.63 10.41	39.9 3.0
11	16.18 0.27	66.6 3.1	28.77 0.24	41.5 2.0	48 58.04 13.25	36.9 2.7
21	16.45 0.33	63.5 2.8	29.01 0.26	39.5 1.7	49 11.29 15.65	34.2 2.4
31	16.78 0.36	60.7 2.3	29.27 0.28	37.8 1.5	49 26.94 17.61	31.8 2.0
Feb. 10	17.14 0.39	58.4 1.6	29.55 0.29	36.3 1.2	49 44.55 19.12	29.8 1.4
20	17.53 0.41	56.8 1.0	29.84 0.29	35.1 0.9	50 3.67 20.17	28.4 1.0
March 2	17.94 0.42	55.8 0.4	30.13 0.30	34.2 0.4	50 23.84 20.75	27.4 0.5
12	18.36 0.41	55.4 0.3	30.43 0.30	33.8 0.0	50 44.59 20.84	26.9 0.0
22	18.77 0.39	55.7 0.9	30.73 0.29	33.8 0.4	51 5.43 20.48	26.9 0.4
April 1	19.16 0.36	56.6 1.5	31.02 0.27	34.2 0.8	51 25.91 19.70	27.3 0.9
11	19.52 0.34	58.1 2.0	31.29 0.26	35.0 1.2	51 45.61 18.55	28.2 1.3
21	19.86 0.31	60.1 2.5	31.55 0.23	36.2 1.5	52 4.16 17.00	29.5 1.8
May 1	20.17 0.26	62.6 2.9	31.78 0.21	37.7 1.7	52 21.16 15.10	31.3 2.1
11	20.43 0.20	65.5 3.1	31.99 0.19	39.4 1.9	52 36.26 12.91	33.4 2.4
21	20.63 0.15	68.6 3.3	32.18 0.17	41.3 2.0	52 49.17 10.44	35.8 2.8
31	20.78 0.10	71.9 3.3	32.35 0.14	43.3 2.0	52 59.61 7.73	38.6 3.0
June 10	20.88 0.03	75.2 3.3	32.49 0.09	45.3 2.0	53 7.34 4.85	41.6 3.0
20	20.91 0.03	78.5 3.2	32.58 0.05	47.3 2.0	53 12.19 1.88	44.6 3.0
30	20.88 0.08	81.7 3.0	32.63 0.01	49.3 1.9	53 14.07 1.17	47.6 3.0
July 10	20.80 0.15	84.7 2.7	32.64 0.02	51.2 1.6	53 12.90 4.12	50.6 2.8
20	20.65 0.21	87.4 2.4	32.62 0.07	52.8 1.4	53 8.78 6.92	53.4 2.6
30	20.44 0.25	89.8 2.0	32.55 0.10	54.2 1.2	53 1.86 9.55	56.0 2.3
Aug. 9	20.19 0.28	91.8 1.5	32.45 0.13	55.4 1.0	52 52.31 11.88	58.3 1.9
19	19.91 0.31	93.3 1.0	32.32 0.16	56.4 0.7	52 40.43 13.77	60.2 1.5
29	19.60 0.34	94.3 0.6	32.16 0.18	57.1 0.4	52 26.66 15.17	61.7 0.9
Sept. 8	19.26 0.35	94.9 0.1	31.98 0.18	57.5 0.2	52 11.49 16.00	62.6 0.3
18	18.91 0.36	95.0 0.4	31.80 0.18	57.7 0.1	51 55.49 16.27	62.9 0.3
28	18.55 0.34	94.6 0.9	31.62 0.17	57.6 0.3	51 39.22 15.87	62.6 0.9
Oct. 8	18.21 0.31	93.7 1.4	31.45 0.15	57.3 0.7	51 23.35 14.82	61.7 1.4
18	17.90 0.28	92.3 1.9	31.30 0.13	56.6 1.0	51 8.53 13.14	60.3 2.0
28	17.62 0.23	90.4 2.4	31.17 0.09	55.6 1.2	50 55.39 10.92	58.3 2.4
Nov. 7	17.39 0.16	88.0 2.7	31.08 0.04	54.4 1.5	50 44.47 8.25	55.9 2.9
17	17.23 0.10	85.3 3.0	31.04 0.00	52.9 1.7	50 36.22 5.20	53.0 3.2
27	17.13 0.05	82.3 3.2	31.04 0.04	51.2 2.0	50 31.02 1.85	49.8 3.3
Dec. 7	17.06 0.03	79.1 3.5	31.08 0.09	49.2 2.1	50 29.17 1.59	46.5 3.3
17	17.11 0.11	75.6 3.6	31.17 0.14	47.1 2.2	50 30.76 5.00	43.2 3.3
27	17.22 0.18	72.0 3.4	31.31 0.19	44.9 2.1	50 35.76 8.27	39.9 3.2
37	17.40	68.6	31.50	42.8	50 44.03	36.7

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ DRACONIS.		μ^1 Sagittarii.		α LYRÆ. (Vega.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 17 ^m 53	51° 29'	^h 18 ^m 5	21° 5'	^h 18 ^m 32	38° 39'
Jan. 1	21.10 0.17	75.5 3.4	26.68 0.20	32.7 0.2	12.84 0.14	18.0 3.2
11	21.27 0.23	72.1 3.1	26.88 0.24	32.9 0.1	12.98 0.17	14.8 2.9
21	21.50 0.29	69.0 2.9	27.12 0.26	33.0 0.2	13.15 0.21	11.9 2.7
31	21.79 0.33	66.1 2.5	27.38 0.28	33.2 0.2	13.36 0.25	9.2 2.4
Feb. 10	22.12 0.36	63.6 1.9	27.66 0.30	33.4 0.2	13.61 0.29	6.8 1.9
20	22.48 0.40	61.7 1.3	27.96 0.33	33.6 0.0	13.90 0.31	4.9 1.4
March 2	22.88 0.41	60.5 0.6	28.29 0.33	33.6 0.0	14.21 0.33	3.5 0.9
12	23.29 0.40	59.9 0.0	28.62 0.32	33.6 0.1	14.54 0.33	2.6 0.3
22	23.69 0.40	59.9 0.6	28.94 0.31	33.5 0.2	14.87 0.34	2.3 0.2
April 1	24.09 0.38	60.5 1.2	29.25 0.30	33.3 0.3	15.21 0.34	2.5 0.8
11	24.47 0.34	61.7 1.8	29.55 0.31	33.0 0.3	15.55 0.32	3.3 1.4
21	24.81 0.33	63.5 2.4	29.86 0.30	32.7 0.4	15.87 0.31	4.7 2.0
May 1	25.14 0.29	65.9 2.8	30.16 0.28	32.3 0.3	16.18 0.29	6.7 2.4
11	25.43 0.24	68.7 3.0	30.44 0.25	32.0 0.4	16.47 0.26	9.1 2.7
21	25.67 0.19	71.7 3.1	30.69 0.22	31.6 0.4	16.73 0.22	11.8 2.9
31	25.86 0.13	74.8 3.3	30.91 0.19	31.2 0.3	16.95 0.18	14.7 3.0
June 10	25.99 0.07	78.1 3.4	31.10 0.16	30.9 0.3	17.13 0.14	17.7 3.1
20	26.06 0.02	81.5 3.4	31.26 0.12	30.6 0.2	17.27 0.09	20.8 3.2
30	26.08 0.05	84.9 3.1	31.38 0.08	30.4 0.2	17.36 0.04	24.0 3.1
July 10	26.03 0.11	88.0 2.9	31.46 0.03	30.2 0.1	17.40 0.02	27.1 2.9
20	25.92 0.16	90.9 2.6	31.49 0.03	30.1 0.0	17.38 0.06	30.0 2.8
30	25.76 0.22	93.5 2.2	31.46 0.07	30.1 0.0	17.32 0.11	32.8 2.5
Aug. 9	25.54 0.26	95.7 1.8	31.39 0.10	30.1 0.0	17.21 0.15	35.3 2.0
19	25.28 0.30	97.5 1.5	31.29 0.12	30.1 0.0	17.06 0.19	37.3 1.6
29	24.98 0.32	99.0 1.0	31.17 0.15	30.1 0.1	16.87 0.22	38.9 1.2
Sept. 8	24.66 0.34	100.0 0.5	31.02 0.17	30.0 0.0	16.65 0.24	40.1 0.9
18	24.32 0.34	100.5 0.1	30.85 0.19	30.0 0.0	16.41 0.27	41.0 0.5
28	23.98 0.33	100.4 0.6	30.66 0.18	30.0 0.1	16.14 0.27	41.5 0.0
Oct. 8	23.65 0.32	99.8 1.1	30.48 0.16	29.9 0.1	15.87 0.24	41.5 0.5
18	23.33 0.30	98.7 1.6	30.32 0.13	29.8 0.2	15.63 0.22	41.0 1.0
28	23.03 0.25	97.1 2.0	30.19 0.10	29.6 0.1	15.41 0.20	40.0 1.5
Nov. 7	22.78 0.20	95.1 2.5	30.09 0.06	29.5 0.2	15.21 0.16	38.5 1.9
17	22.58 0.14	92.6 2.8	30.03 0.02	29.3 0.1	15.05 0.12	36.6 2.3
27	22.44 0.07	89.8 3.1	30.01 0.04	29.2 0.1	14.93 0.07	34.3 2.6
Dec. 7	22.37 0.00	86.7 3.3	30.05 0.08	29.1 0.0	14.86 0.01	31.7 2.8
17	22.37 0.07	83.4 3.4	30.13 0.13	29.1 0.1	14.85 0.05	28.9 3.0
27	22.44 0.14	80.0 3.5	30.26 0.18	29.2 0.1	14.90 0.09	25.9 3.1
37	22.58	76.5	30.44	29.3	14.99	22.8

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	β LYRA.		ζ AQUILA.		δ AQUILA.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 18 ^m 44	[°] 33 ['] 11	^h 18 ^m 59	[°] 18 ['] 39	^h 19 ^m 18	[°] 2 ['] 50
Jan. 1	55.90 0.11	68.9 2.9	0.66 0.12	32.4 2.0	28.95 0.10	23.9 1.4
11	56.01 0.16	66.0 2.8	0.78 0.15	30.4 1.9	29.06 0.14	22.5 1.3
21	56.17 0.21	63.2 2.6	0.93 0.19	28.5 1.8	29.19 0.18	21.2 1.1
31	56.38 0.24	60.6 2.3	1.12 0.21	26.7 1.6	29.37 0.21	20.1 0.9
Feb. 10	56.62 0.26	58.3 1.9	1.33 0.24	25.1 1.2	29.58 0.23	19.2 0.8
20	56.88 0.28	56.4 1.3	1.57 0.26	23.9 0.9	29.81 0.24	18.4 0.6
March 2	57.16 0.30	55.1 0.9	1.83 0.28	23.0 0.5	30.06 0.26	17.8 0.3
12	57.46 0.32	54.2 0.4	2.11 0.29	22.5 0.1	30.31 0.28	17.5 0.1
22	57.78 0.33	53.8 0.2	2.40 0.29	22.4 0.2	30.59 0.30	17.6 0.4
April 1	58.11 0.33	54.0 0.8	2.69 0.30	22.6 0.6	30.89 0.30	18.0 0.7
11	58.44 0.32	54.8 1.3	2.99 0.29	23.2 1.1	31.19 0.30	18.7 1.1
21	58.76 0.29	56.1 1.7	3.28 0.28	24.3 1.5	31.49 0.28	19.8 1.3
May 1	59.05 0.28	57.8 2.1	3.56 0.28	25.8 1.8	31.77 0.28	21.1 1.5
11	59.33 0.26	59.9 2.5	3.84 0.26	27.6 2.0	32.06 0.27	22.6 1.6
21	59.59 0.24	62.4 2.9	4.10 0.23	29.6 2.1	32.32 0.26	24.2 1.8
31	59.83 0.20	65.3 3.0	4.33 0.21	31.7 2.3	32.58 0.23	26.0 1.9
June 10	60.03 0.15	68.3 3.0	4.54 0.18	34.0 2.3	32.81 0.20	27.9 1.8
20	60.18 0.11	71.3 3.0	4.72 0.14	36.3 2.3	33.01 0.16	29.7 1.8
30	60.29 0.06	74.3 2.9	4.86 0.10	38.6 2.2	33.17 0.12	31.5 1.7
July 10	60.35 0.01	77.2 2.8	4.96 0.05	40.8 2.0	33.29 0.08	33.2 1.6
20	60.36 0.04	80.0 2.6	5.01 0.00	42.8 1.9	33.37 0.04	34.8 1.4
30	60.32 0.09	82.6 2.3	5.01 0.04	44.7 1.7	33.41 0.00	36.2 1.2
Aug. 9	60.23 0.13	84.9 2.0	4.97 0.08	46.4 1.4	33.41 0.05	37.4 1.0
19	60.10 0.16	86.9 1.7	4.89 0.11	47.8 1.2	33.36 0.10	38.4 0.9
29	59.94 0.19	88.6 1.3	4.78 0.14	49.0 0.9	33.26 0.12	39.3 0.7
Sept. 8	59.75 0.21	89.9 0.9	4.64 0.16	49.9 0.7	33.14 0.14	40.0 0.5
18	59.54 0.23	90.8 0.5	4.48 0.19	50.6 0.4	33.00 0.16	40.5 0.2
28	59.31 0.23	91.3 0.1	4.29 0.19	51.0 0.1	32.84 0.17	40.7 0.0
Oct. 8	59.08 0.23	91.4 0.4	4.10 0.18	51.1 0.3	32.67 0.17	40.7 0.2
18	58.85 0.21	91.0 0.9	3.92 0.15	50.8 0.6	32.50 0.16	40.5 0.3
28	58.64 0.18	90.1 1.3	3.77 0.13	50.2 0.9	32.34 0.14	40.2 0.5
Nov. 7	58.46 0.15	88.8 1.6	3.64 0.11	49.3 1.1	32.20 0.11	39.7 0.7
17	58.31 0.11	87.2 1.9	3.53 0.09	48.2 1.3	32.09 0.07	39.0 0.9
27	58.20 0.07	85.3 2.3	3.44 0.04	46.9 1.5	32.02 0.03	38.1 1.1
Dec. 7	58.13 0.01	83.0 2.6	3.40 0.01	45.4 1.7	31.99 0.00	37.0 1.1
17	58.12 0.04	80.4 2.9	3.41 0.05	43.7 1.9	31.99 0.04	35.9 1.2
27	58.16 0.10	77.5 2.9	3.46 0.10	41.8 2.0	32.03 0.08	34.7 1.3
37	58.26	74.6	3.56	39.8	32.11	33.4

NOTE. — Before the 22d of March the Sidereal-day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ AQUILÆ.		α AQUILÆ. (Altair.)		β AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 19 ^m 39	[°] 10 ['] 16	^h 19 ^m 43	[°] 8 ['] 30	^h 19 ^m 48	[°] 6 ['] 3
Jan. 1	38.60 0.08	36.6 1.7	59.64 0.08	12.7 1.6	28.70 0.07	42.1 1.4
11	38.68 0.12	34.9 1.6	59.72 0.11	11.1 1.5	28.77 0.11	40.7 1.4
21	38.80 0.15	33.3 1.6	59.83 0.15	9.6 1.5	28.88 0.14	39.3 1.3
31	38.95 0.18	31.7 1.4	59.96 0.18	8.1 1.3	29.02 0.17	38.0 1.2
Feb. 10	39.13 0.20	30.3 1.1	60.16 0.20	6.8 0.9	29.19 0.20	36.8 0.9
20	39.33 0.23	29.2 0.8	60.36 0.23	5.9 0.7	29.39 0.23	35.9 0.6
March 2	39.56 0.25	28.4 0.5	60.59 0.25	5.2 0.4	29.62 0.25	35.3 0.3
12	39.81 0.27	27.9 0.1	60.84 0.27	4.8 0.1	29.87 0.27	35.0 0.0
22	40.06 0.29	27.8 0.3	61.11 0.28	4.7 0.3	30.14 0.28	35.0 0.3
April 1	40.37 0.30	28.1 0.7	61.39 0.30	5.0 0.7	30.42 0.29	35.3 0.7
11	40.67 0.30	28.8 1.0	61.69 0.30	5.7 1.0	30.71 0.30	36.0 1.0
21	40.97 0.29	29.8 1.3	61.99 0.30	6.7 1.4	31.01 0.30	37.0 1.3
May 1	41.26 0.29	31.1 1.6	62.29 0.30	8.1 1.7	31.31 0.30	38.3 1.6
11	41.55 0.28	32.7 1.9	62.59 0.28	9.8 1.8	31.61 0.28	39.9 1.8
21	41.83 0.27	34.6 2.1	62.87 0.26	11.6 2.0	31.89 0.26	41.7 1.9
31	42.10 0.24	36.7 2.2	63.13 0.24	13.6 2.1	32.15 0.25	43.6 2.0
June 10	42.34 0.21	38.9 2.2	63.37 0.22	15.7 2.2	32.40 0.22	45.6 2.0
20	42.55 0.18	41.1 2.2	63.59 0.18	17.9 2.1	32.62 0.19	47.6 2.0
30	42.73 0.13	43.3 2.1	63.77 0.14	20.0 2.1	32.81 0.15	49.6 1.9
July 10	42.86 0.09	45.4 2.0	63.91 0.10	22.1 1.9	32.96 0.10	51.5 1.8
20	42.95 0.05	47.4 1.9	64.01 0.06	24.0 1.8	33.06 0.06	53.3 1.7
30	43.00 0.00	49.3 1.7	64.07 0.02	25.8 1.6	33.12 0.02	55.0 1.5
Aug. 9	43.00 0.04	51.0 1.5	64.09 0.04	27.4 1.4	33.14 0.03	56.5 1.3
19	42.96 0.07	52.5 1.3	64.05 0.09	28.8 1.2	33.11 0.07	57.8 1.1
29	42.89 0.11	53.8 1.0	63.96 0.11	30.0 1.0	33.04 0.11	58.9 0.8
Sept. 8	42.78 0.14	54.8 0.7	63.85 0.13	31.0 0.7	32.98 0.13	59.7 0.6
18	42.64 0.17	55.5 0.4	63.72 0.16	31.7 0.4	32.80 0.15	60.3 0.4
28	42.47 0.17	55.9 0.1	63.56 0.17	32.1 0.2	32.65 0.16	60.7 0.2
Oct. 8	42.30 0.17	56.0 0.0	63.39 0.17	32.3 0.0	32.49 0.17	60.9 0.1
18	42.13 0.17	56.0 0.3	63.22 0.16	32.3 0.3	32.32 0.17	60.8 0.3
28	41.96 0.15	55.7 0.5	63.06 0.15	32.0 0.5	32.15 0.15	60.5 0.5
Nov. 7	41.81 0.12	55.2 0.8	62.91 0.12	31.5 0.8	32.00 0.12	60.0 0.8
17	41.69 0.10	54.4 1.1	62.79 0.09	30.7 1.0	31.88 0.09	59.2 1.0
27	41.59 0.07	53.3 1.3	62.70 0.06	29.7 1.2	31.79 0.06	58.2 1.1
Dec. 7	41.52 0.02	52.0 1.4	62.64 0.02	28.5 1.3	31.73 0.03	57.1 1.2
17	41.50 0.02	50.6 1.5	62.62 0.01	27.2 1.4	31.70 0.01	55.9 1.3
27	41.52 0.06	49.1 1.7	62.63 0.06	25.8 1.5	31.71 0.06	54.6 1.4
37	41.58	47.4	62.69	24.3	31.77	53.2

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	λ URSAE MINORIS.		α^2 CAPRICORN.		α PAVONIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 20	[°] 53'	^h ^m 20 10	[°] 58'	^h ^m 20 14	[°] 57' 10"
Jan. 1	^m ^s ^s 1 27.17 4.48	["] ["] 42.0 3.0	^s ^s 20.16 0.07	["] ["] 26.0 0.2	^s ^s 37.43 0.07	["] ["] 40.1 2.4
11	1 22.69 2.27	39.0 3.1	20.23 0.10	26.2 0.2	37.50 0.14	37.7 2.4
21	1 20.42 0.03	35.9 3.2	20.33 0.13	26.4 0.2	37.64 0.20	35.3 2.5
31	1 20.39 2.23	32.7 3.1	20.46 0.16	26.6 0.0	37.84 0.26	32.8 2.5
Feb. 10	1 22.62 4.37	29.6 2.8	20.62 0.20	26.6 0.2	38.10 0.32	30.3 2.4
20	1 26.99 6.31	26.8 2.6	20.82 0.22	26.4 0.3	38.42 0.37	27.9 2.4
March 2	1 33.30 7.96	24.2 2.1	21.04 0.25	26.1 0.5	38.79 0.41	25.5 2.2
12	1 41.26 9.25	22.1 1.6	21.29 0.27	25.6 0.7	39.20 0.44	23.3 1.9
22	1 50.51 10.18	20.5 1.1	21.56 0.28	24.9 0.8	39.64 0.47	21.4 1.7
April 1	2 0.69 10.72	19.4 0.5	21.84 0.30	24.1 1.0	40.11 0.51	19.7 1.6
11	2 11.41 10.85	18.9 0.1	22.14 0.30	23.1 1.1	40.62 0.51	18.2 1.2
21	2 22.26 10.55	19.0 0.7	22.44 0.31	22.0 1.3	41.13 0.51	17.0 0.9
May 1	2 32.81 9.87	19.7 1.3	22.75 0.31	20.7 1.3	41.64 0.52	16.1 0.6
11	2 42.68 8.89	21.0 1.8	23.06 0.30	19.4 1.4	42.16 0.50	15.5 0.2
21	2 51.57 7.66	22.8 2.4	23.36 0.30	18.0 1.4	42.66 0.49	15.3 0.1
31	2 59.23 6.17	25.2 2.8	23.66 0.28	16.6 1.3	43.15 0.46	15.4 0.4
June 10	3 5.40 4.50	28.0 3.0	23.94 0.25	15.3 1.3	43.61 0.41	15.8 0.8
20	3 9.90 2.71	31.0 3.2	24.19 0.22	14.0 1.2	44.02 0.35	16.6 1.2
30	3 12.61 0.86	34.2 3.4	24.41 0.18	12.8 1.0	44.37 0.29	17.8 1.5
July 10	3 13.47 1.00	37.6 3.4	24.59 0.14	11.8 0.8	44.66 0.22	19.3 1.6
20	3 12.47 2.83	41.0 3.5	24.73 0.10	11.0 0.6	44.88 0.15	20.9 1.8
30	3 9.64 4.61	44.5 3.4	24.83 0.05	10.4 0.5	45.03 0.07	22.7 1.9
Aug. 9	3 5.03 6.28	47.9 3.2	24.88 0.00	9.9 0.3	45.10 0.02	24.6 1.9
19	2 58.75 7.81	51.1 3.0	24.88 0.05	9.6 0.2	45.06 0.11	26.5 1.9
29	2 50.94 9.20	54.1 2.7	24.83 0.09	9.4 0.0	44.97 0.17	28.4 1.8
Sept. 8	2 41.74 10.43	56.8 2.4	24.74 0.11	9.4 0.1	44.80 0.22	30.2 1.6
18	2 31.31 11.42	59.2 2.0	24.63 0.14	9.5 0.1	44.58 0.26	31.8 1.3
28	2 19.89 12.18	61.2 1.6	24.49 0.15	9.6 0.2	44.32 0.31	33.1 1.0
Oct. 8	2 7.71 12.68	62.8 1.1	24.34 0.16	9.8 0.3	44.01 0.33	34.1 0.6
18	1 55.03 12.93	63.9 0.6	24.18 0.17	10.1 0.3	43.68 0.33	34.7 0.1
28	1 42.10 12.84	64.5 0.0	24.01 0.15	10.4 0.3	43.35 0.31	34.8 0.3
Nov. 7	1 29.26 12.44	64.5 0.6	23.86 0.12	10.7 0.3	43.04 0.27	34.5 0.7
17	1 16.82 11.74	63.9 1.0	23.74 0.10	11.0 0.3	42.77 0.23	33.8 1.0
27	1 5.08 10.68	62.9 1.6	23.64 0.06	11.3 0.3	42.54 0.18	32.8 1.4
Dec. 7	0 54.40 9.30	61.3 2.0	23.58 0.03	11.6 0.3	42.36 0.14	31.4 1.7
17	0 45.10 7.63	59.3 2.5	23.55 0.00	11.9 0.3	42.24 0.05	29.7 2.1
27	0 37.47 5.69	56.8 2.9	23.55 0.04	12.2 0.3	42.19 0.03	27.6 2.3
37	0 31.78	53.9	23.59	12.5	42.22	25.3

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CYGNI.		β^1 CYGNI.		ζ Cygni.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	$20^h 36^m$	$44^\circ 46'$	$21^h 0^m$	$38^\circ 3'$	$21^h 7^m$	$29^\circ 39'$
Jan. 1	40.46 0.05	73.4 2.8	39.11 0.03	72.2 2.3	0.70 0.04	37.6 2.1
11	40.41 0.01	70.6 2.9	39.08 0.00	69.9 2.5	0.66 0.01	35.5 2.3
21	40.42 0.08	67.7 2.9	39.06 0.06	67.4 2.6	0.67 0.05	33.2 2.4
31	40.50 0.13	64.8 2.8	39.14 0.11	64.8 2.5	0.72 0.09	30.8 2.2
Feb. 10	40.63 0.16	62.0 2.6	39.25 0.14	62.3 2.3	0.81 0.13	28.6 2.0
20	40.79 0.20	59.4 2.3	39.39 0.17	60.0 2.1	0.94 0.16	26.6 1.8
March 2	40.99 0.25	57.1 1.9	39.56 0.22	57.9 1.7	1.10 0.20	24.8 1.4
12	41.24 0.30	55.2 1.3	39.78 0.27	56.2 1.1	1.30 0.23	23.4 1.0
22	41.54 0.33	53.9 0.8	40.05 0.30	55.1 0.7	1.53 0.26	22.4 0.6
April 1	41.87 0.36	53.1 0.3	40.35 0.32	54.4 0.2	1.79 0.29	21.8 0.1
11	42.23 0.36	52.8 0.4	40.67 0.35	54.2 0.4	2.08 0.31	21.7 0.4
21	42.59 0.37	53.2 0.9	41.02 0.36	54.6 0.9	2.39 0.32	22.1 0.9
May 1	42.96 0.37	54.1 1.5	41.38 0.36	55.5 1.4	2.71 0.33	23.0 1.4
11	43.33 0.37	55.6 2.0	41.74 0.36	56.9 1.9	3.04 0.33	24.4 1.8
21	43.70 0.36	57.6 2.4	42.10 0.35	58.8 2.3	3.37 0.33	26.2 2.2
31	44.06 0.32	60.0 2.8	42.45 0.33	61.1 2.7	3.70 0.31	28.4 2.5
June 10	44.38 0.28	62.8 3.0	42.78 0.30	63.8 3.0	4.01 0.28	30.9 2.7
20	44.66 0.24	65.8 3.3	43.08 0.27	66.8 3.2	4.29 0.25	33.6 2.9
30	44.90 0.19	69.1 3.4	43.35 0.23	70.0 3.3	4.54 0.22	36.5 3.0
July 10	45.09 0.13	72.5 3.4	43.58 0.17	73.3 3.3	4.76 0.17	39.5 3.0
20	45.22 0.08	75.9 3.4	43.75 0.12	76.6 3.3	4.93 0.12	42.5 2.9
30	45.30 0.02	79.3 3.3	43.87 0.07	79.9 3.2	5.05 0.07	45.4 2.8
Aug. 9	45.32 0.03	82.6 3.1	43.94 0.02	83.1 3.0	5.12 0.03	48.2 2.6
19	45.29 0.09	85.7 2.8	43.96 0.04	86.1 2.9	5.15 0.02	50.8 2.5
29	45.20 0.14	88.5 2.5	43.92 0.08	89.0 2.6	5.13 0.06	53.3 2.2
Sept. 8	45.06 0.18	91.0 2.2	43.84 0.11	91.6 2.3	5.07 0.10	55.5 1.9
18	44.88 0.21	93.2 1.9	43.73 0.15	93.9 1.9	4.97 0.14	57.4 1.6
28	44.67 0.24	95.1 1.4	43.58 0.18	95.8 1.6	4.83 0.16	59.0 1.2
Oct. 8	44.43 0.25	96.5 0.9	43.40 0.20	97.4 1.1	4.67 0.17	60.2 0.8
18	44.18 0.27	97.4 0.4	43.20 0.22	98.5 0.6	4.50 0.19	61.0 0.4
28	43.91 0.26	97.8 0.0	42.98 0.21	99.1 0.1	4.31 0.19	61.4 0.0
Nov. 7	43.65 0.24	97.8 0.6	42.77 0.20	99.2 0.3	4.12 0.18	61.4 0.4
17	43.41 0.22	97.2 1.1	42.57 0.17	98.9 0.7	3.94 0.16	61.0 0.7
27	43.19 0.19	96.1 1.5	42.40 0.16	98.2 1.0	3.78 0.14	60.3 1.1
Dec. 7	43.00 0.15	94.6 2.0	42.24 0.13	97.2 1.6	3.64 0.11	59.2 1.5
17	42.85 0.11	92.6 2.3	42.11 0.10	95.6 2.0	3.53 0.09	57.7 1.8
27	42.74 0.08	90.3 2.6	42.01 0.05	93.6 2.3	3.44 0.05	55.9 2.1
37	42.66	87.7	41.96	91.3	3.39	53.8

after the 23d of March it begins at the Sidereal (h. before the Mean Noon.

**APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.**

Sidereal Day of the Month.	α CEPHEI.		β AQUILÆ.		γ CEPHEI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 21 ^m 15	[°] 61 ['] 59	^h 21 ^m 24	[°] 6 ['] 10	^h 21 ^m 26	[°] 69 ['] 56
Jan. 1	^s 13.38 ^s 0.18	["] 63.4 ["] 2.7	^s 14.27 ^s 0.01	["] 50.2 ["] 0.5	^s 47.97 ^s 0.33	["] 77.8 ["] 2.5
11	13.20 0.12	60.7 2.9	14.26 0.02	50.7 0.4	47.64 0.24	75.3 2.8
21	13.08 0.04	57.8 3.1	14.28 0.06	51.1 0.4	47.40 0.13	72.5 3.2
31	13.04 0.05	54.7 3.1	14.34 0.09	51.5 0.2	47.27 0.01	69.3 3.3
Feb. 10	13.09 0.13	51.6 3.1	14.43 0.12	51.7 0.1	47.26 0.11	66.0 3.2
20	13.22 0.20	48.5 3.0	14.55 0.14	51.8 0.2	47.37 0.23	62.8 3.0
March 2	13.42 0.27	45.5 2.6	14.69 0.17	51.6 0.4	47.60 0.33	59.8 2.7
12	13.69 0.35	42.9 2.1	14.86 0.21	51.2 0.6	47.93 0.43	57.1 2.4
22	14.04 0.42	40.8 1.5	15.07 0.23	50.6 0.8	48.36 0.52	54.7 1.9
April 1	14.46 0.47	39.3 0.8	15.30 0.25	49.8 1.1	48.88 0.59	52.8 1.2
11	14.93 0.49	38.5 0.4	15.55 0.28	48.7 1.3	49.47 0.64	51.6 0.7
21	15.42 0.52	38.1 0.1	15.83 0.30	47.4 1.4	50.11 0.69	50.9 0.1
May 1	15.94 0.53	38.2 0.7	16.13 0.31	46.0 1.6	50.80 0.70	50.8 0.5
11	16.47 0.52	38.9 1.4	16.44 0.31	44.4 1.7	51.50 0.69	51.3 1.2
21	16.99 0.52	40.3 2.1	16.75 0.32	42.7 1.9	52.19 0.66	52.5 1.7
31	17.51 0.48	42.4 2.5	17.07 0.31	40.8 1.9	52.85 0.62	54.2 2.2
June 10	17.99 0.42	44.9 2.8	17.38 0.29	38.9 1.8	53.47 0.55	56.4 2.7
20	18.41 0.34	47.7 3.2	17.67 0.26	37.1 1.7	54.02 0.47	59.1 3.1
30	18.75 0.29	50.9 3.5	17.93 0.23	35.4 1.6	54.49 0.39	62.2 3.4
July 10	19.04 0.22	54.4 3.6	18.16 0.20	33.8 1.4	54.88 0.29	65.6 3.6
20	19.26 0.15	58.0 3.7	18.36 0.16	32.4 1.2	55.17 0.19	69.2 3.7
30	19.41 0.07	61.7 3.7	18.52 0.11	31.2 1.0	55.36 0.08	72.9 3.8
Aug. 9	19.48 0.02	65.4 3.6	18.63 0.06	30.2 0.8	55.44 0.03	76.7 3.7
19	19.46 0.11	69.0 3.5	18.69 0.02	29.4 0.7	55.41 0.13	80.4 3.7
29	19.35 0.18	72.5 3.3	18.71 0.02	28.7 0.4	55.28 0.22	84.1 3.5
Sept. 8	19.17 0.24	75.8 3.0	18.69 0.05	28.3 0.3	55.06 0.32	87.6 3.2
18	18.93 0.28	78.8 2.6	18.64 0.09	28.0 0.1	54.74 0.40	90.8 2.9
28	18.65 0.34	81.4 2.2	18.55 0.12	27.9 0.1	54.34 0.48	93.7 2.5
Oct. 8	18.31 0.38	83.6 1.8	18.43 0.13	28.0 0.3	53.86 0.53	96.2 2.0
18	17.93 0.41	85.4 1.2	18.30 0.14	28.3 0.4	53.33 0.56	98.2 1.6
28	17.52 0.42	86.6 0.7	18.16 0.14	28.7 0.5	52.77 0.59	99.8 1.0
Nov. 7	17.10 0.41	87.3 0.1	18.02 0.13	29.2 0.5	52.18 0.60	100.8 0.4
17	16.69 0.40	87.4 0.5	17.89 0.13	29.7 0.5	51.58 0.59	101.2 0.1
27	16.29 0.37	86.9 1.1	17.76 0.11	30.2 0.5	50.99 0.57	101.1 0.7
Dec. 7	15.92 0.33	85.8 1.4	17.65 0.08	30.7 0.6	50.42 0.52	100.4 1.3
17	15.59 0.29	84.4 2.0	17.57 0.05	31.3 0.6	49.90 0.45	99.1 1.4
27	15.30 0.23	82.4 2.5	17.52 0.02	31.9 0.5	49.45 0.37	97.2 2.3
37	15.07	79.9	17.50	32.4	49.08	94.9

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Pegasi.		α AQUARI.		α Grus.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 21 ^m 37	[°] 9 ['] 14	^h 21 ^m 58	[°] 0 ['] 59	^h 21 ^m 59	[°] 47 ['] 37
Jan. 1	21.45 0.03	25.9 1.2	38.67 0.03	35.9 0.8	27.43 0.07	63.0 1.6
11	21.42 0.00	24.7 1.3	38.64 0.01	36.7 0.7	27.36 0.03	61.4 1.8
21	21.42 0.04	23.4 1.2	38.63 0.02	37.4 0.5	27.33 0.00	59.6 2.1
31	21.46 0.07	22.2 1.1	38.65 0.04	37.9 0.4	27.33 0.05	57.5 2.3
Feb. 10	21.53 0.10	21.1 0.8	38.69 0.06	38.3 0.3	27.38 0.11	55.2 2.4
20	21.63 0.13	20.3 0.8	38.77 0.12	38.6 0.2	27.49 0.15	52.8 2.6
March 2	21.76 0.16	19.5 0.5	38.89 0.14	38.8 0.1	27.64 0.20	50.2 2.7
12	21.92 0.19	19.0 0.2	39.03 0.17	38.7 0.4	27.84 0.24	47.5 2.6
22	22.11 0.22	18.8 0.2	39.20 0.21	38.3 0.6	28.06 0.27	44.9 2.6
April 1	22.33 0.25	19.0 0.5	39.41 0.24	37.7 0.9	28.35 0.31	42.3 2.5
11	22.58 0.27	19.5 0.9	39.65 0.26	36.8 1.2	28.66 0.35	39.8 2.4
21	22.85 0.29	20.4 1.2	39.91 0.28	35.6 1.5	29.01 0.39	37.4 2.2
May 1	23.14 0.31	21.6 1.5	40.19 0.30	34.1 1.6	29.40 0.41	35.2 1.9
11	23.45 0.31	23.1 1.7	40.49 0.31	32.5 1.8	29.81 0.42	33.3 1.7
21	23.76 0.32	24.8 2.0	40.80 0.31	30.7 1.9	30.23 0.43	31.6 1.3
31	24.08 0.31	26.8 2.2	41.11 0.31	28.8 2.0	30.66 0.43	30.3 1.0
June 10	24.39 0.28	29.0 2.2	41.42 0.30	26.8 2.0	31.09 0.41	29.3 0.6
20	24.67 0.26	31.2 2.3	41.72 0.28	24.8 2.1	31.50 0.38	28.7 0.2
30	24.93 0.23	33.5 2.2	42.00 0.26	22.7 1.9	31.88 0.35	28.5 0.1
July 10	25.16 0.20	35.7 2.2	42.26 0.22	20.8 1.7	32.23 0.30	28.6 0.5
20	25.36 0.17	37.9 2.1	42.48 0.18	19.1 1.5	32.53 0.26	29.1 1.0
30	25.53 0.13	40.0 1.9	42.66 0.14	17.6 1.4	32.79 0.20	30.1 1.3
Aug. 9	25.66 0.07	41.9 1.7	42.80 0.10	16.2 1.2	32.99 0.13	31.4 1.5
19	25.73 0.02	43.6 1.5	42.90 0.05	15.0 0.9	33.12 0.06	32.9 1.6
29	25.75 0.01	45.1 1.3	42.95 0.01	14.1 0.7	33.18 0.00	34.5 1.8
Sept. 8	25.74 0.05	46.4 1.0	42.96 0.03	13.4 0.5	33.18 0.06	36.3 1.9
18	25.69 0.09	47.4 0.8	42.93 0.06	12.9 0.3	33.12 0.10	38.2 1.9
28	25.60 0.11	48.2 0.6	42.87 0.09	12.6 0.1	33.02 0.15	40.1 1.8
Oct. 8	25.49 0.12	48.8 0.3	42.78 0.11	12.5 0.0	32.87 0.20	41.9 1.5
18	25.37 0.14	49.1 0.0	42.67 0.13	12.5 0.2	32.67 0.22	43.4 1.2
28	25.23 0.14	49.1 0.1	42.54 0.13	12.7 0.3	32.45 0.23	44.6 0.9
Nov. 7	25.09 0.14	49.0 0.4	42.41 0.13	13.0 0.5	32.22 0.23	45.5 0.6
17	24.95 0.13	48.6 0.6	42.28 0.12	13.5 0.6	31.99 0.23	46.1 0.3
27	24.82 0.11	48.0 0.8	42.16 0.11	14.1 0.7	31.76 0.21	46.4 0.1
Dec. 7	24.71 0.09	47.2 1.0	42.05 0.09	14.8 0.7	31.55 0.17	46.3 0.6
17	24.62 0.07	46.2 1.1	41.96 0.08	15.5 0.7	31.38 0.14	45.7 1.1
27	24.55 0.05	45.1 1.2	41.88 0.05	16.2 0.7	31.24 0.10	44.6 1.4
37	24.50	43.9	41.83	16.9	31.14	43.2

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sideral Day of the Month.	ζ Pegasi.		α PISCIS AUSTRALIS. (Fomalhaut.)		α PEGAS. (Markab.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 22 34	10° 6'	^h ^m 22 49	30° 21'	^h ^m 22 57	14° 27'
Jan. 1	31.84 0.07	31.1 1.1	58.15 0.09	36.8 0.5	50.60 0.09	37.8 1.1
11	31.77 0.04	30.0 1.2	58.06 0.06	36.3 0.8	50.51 0.06	36.7 1.1
21	31.73 0.02	28.8 1.1	58.00 0.03	35.5 1.1	50.45 0.04	35.6 1.2
31	31.71 0.01	27.7 1.0	57.97 0.00	34.4 1.3	50.41 0.02	34.4 1.2
Feb. 10	31.72 0.04	26.7 0.8	57.97 0.03	33.1 1.5	50.39 0.01	33.2 1.2
20	31.76 0.08	25.9 0.7	58.00 0.07	31.6 1.8	50.40 0.05	32.0 1.1
March 2	31.84 0.10	25.2 0.5	58.07 0.09	29.8 1.9	50.45 0.09	30.9 0.8
12	31.94 0.14	24.7 0.3	58.16 0.14	27.9 2.0	50.54 0.12	30.1 0.4
22	32.08 0.17	24.4 0.0	58.30 0.17	25.9 2.2	50.66 0.15	29.7 0.4
April 1	32.25 0.21	24.4 0.4	58.47 0.21	23.7 2.3	50.81 0.19	29.5 0.2
11	32.46 0.24	24.8 0.8	58.68 0.25	21.4 2.4	51.00 0.22	29.7 0.5
21	32.70 0.27	25.6 1.1	58.93 0.28	19.0 2.4	51.22 0.26	30.2 0.8
May 1	32.97 0.30	26.7 1.4	59.21 0.31	16.6 2.3	51.48 0.29	31.0 1.1
11	33.27 0.31	28.1 1.6	59.52 0.33	14.3 2.0	51.77 0.31	32.1 1.5
21	33.58 0.31	29.7 1.9	59.85 0.35	12.3 1.9	52.08 0.32	33.6 1.8
31	33.89 0.32	31.6 2.1	60.20 0.35	10.4 1.7	52.40 0.33	35.4 2.0
June 10	34.21 0.31	33.7 2.2	60.55 0.35	8.7 1.6	52.73 0.32	37.4 2.2
20	34.52 0.30	35.9 2.2	60.90 0.35	7.1 1.4	53.05 0.31	39.6 2.2
30	34.82 0.27	38.1 2.3	61.25 0.33	5.7 1.0	53.36 0.28	41.9 2.4
July 10	35.09 0.24	40.4 2.2	61.58 0.29	4.7 0.6	53.64 0.26	44.3 2.2
20	35.33 0.21	42.6 2.1	61.87 0.24	4.1 0.2	53.90 0.23	46.6 2.2
30	35.54 0.17	44.7 2.0	62.11 0.20	3.9 0.1	54.13 0.19	48.8 2.2
Aug. 9	35.71 0.13	46.7 1.8	62.31 0.16	4.0 0.4	54.32 0.15	51.0 2.1
19	35.84 0.09	48.5 1.7	62.47 0.13	4.4 0.8	54.47 0.12	53.1 1.9
29	35.93 0.04	50.2 1.5	62.60 0.08	5.2 1.0	54.59 0.08	55.0 1.7
Sept. 8	35.97 0.01	51.7 1.2	62.68 0.02	6.2 1.1	54.67 0.02	56.7 1.4
18	35.98 0.03	52.9 0.8	62.70 0.03	7.3 1.3	54.69 0.02	58.1 1.2
28	35.95 0.06	53.7 0.6	62.67 0.06	8.6 1.3	54.67 0.04	59.3 0.9
Oct. 8	35.89 0.09	54.3 0.5	62.61 0.10	9.9 1.4	54.63 0.07	60.2 0.7
18	35.80 0.11	54.8 0.3	62.51 0.13	11.3 1.4	54.56 0.09	60.9 0.5
28	35.69 0.12	55.1 0.0	62.38 0.14	12.7 1.2	54.47 0.11	61.4 0.2
Nov. 7	35.57 0.12	55.1 0.2	62.24 0.14	13.9 1.0	54.36 0.12	61.6 0.0
17	35.45 0.13	54.9 0.5	62.10 0.15	14.9 0.8	54.24 0.12	61.6 0.3
27	35.32 0.12	54.4 0.6	61.95 0.16	15.7 0.5	54.12 0.12	61.3 0.6
Dec. 7	35.20 0.11	53.8 0.8	61.79 0.14	16.2 0.3	54.00 0.11	60.7 0.7
17	35.09 0.09	53.0 0.9	61.65 0.12	16.5 0.0	53.89 0.11	60.0 0.2
27	35.00 0.08	52.1 1.0	61.53 0.10	16.5 0.4	53.78 0.09	59.1 1.0
37	34.92	51.1	61.43	16.1	53.69	58.1

NOTE. — Before the 22d of March the Sideral day of the Month begins at the Sideral Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Pleiades.		γ Cephei.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 23 ^m 32	[°] 4	^h 23 ^m 33	[°] 76
Jan. 1	48.68 0.09	52 29.8 0.8	38.32 0.80	51 48.7 1.1
11	48.59 0.06	52 29.0 0.8	37.52 0.74	51 47.6 1.5
21	48.51 0.06	52 28.2 0.7	36.78 0.65	51 46.1 2.0
31	48.45 0.04	52 27.5 0.7	36.13 0.59	51 44.1 2.5
Feb. 10	48.41 0.02	52 26.8 0.5	35.61 0.36	51 41.6 2.8
20	48.39 0.04	52 26.3 0.4	35.25 0.21	51 38.8 3.0
March 2	48.40 0.04	52 25.9 0.2	35.04 0.05	51 35.8 3.1
12	48.44 0.09	52 25.7 0.0	34.99 0.15	51 32.7 3.0
22	48.53 0.13	52 25.7 0.3	35.14 0.34	51 29.7 2.9
April 1	48.66 0.16	52 26.0 0.6	35.48 0.51	51 26.8 2.6
11	48.82 0.19	52 26.6 0.9	35.99 0.65	51 24.2 2.2
21	49.01 0.23	52 27.5 1.1	36.64 0.78	51 22.0 1.7
May 1	49.24 0.27	52 28.6 1.4	37.42 0.89	51 20.3 1.1
11	49.51 0.29	52 30.0 1.6	38.31 0.97	51 19.2 0.6
21	49.80 0.30	52 31.6 1.8	39.28 1.03	51 18.6 0.1
31	50.10 0.32	52 33.4 2.0	40.31 1.05	51 18.5 0.5
June 10	50.42 0.32	52 35.4 2.1	41.36 1.03	51 19.0 1.1
20	50.74 0.38	52 37.5 2.1	42.39 0.99	51 20.1 1.7
30	51.06 0.39	52 39.6 2.1	43.38 0.92	51 21.8 2.2
July 10	51.36 0.28	52 41.7 2.0	44.30 0.85	51 24.0 2.5
20	51.64 0.35	52 43.7 1.9	45.15 0.76	51 26.5 2.9
30	51.89 0.28	52 45.6 1.8	45.91 0.63	51 29.4 3.3
Aug. 9	52.11 0.18	52 47.4 1.6	46.54 0.49	51 32.7 3.5
19	52.29 0.15	52 49.0 1.3	47.03 0.35	51 36.2 3.7
29	52.44 0.11	52 50.3 1.1	47.38 0.22	51 39.9 3.8
Sept. 8	52.55 0.07	52 51.4 0.9	47.60 0.09	51 43.7 3.8
18	52.62 0.02	52 52.3 0.6	47.69 0.05	51 47.5 3.9
28	52.64 0.09	52 52.9 0.4	47.64 0.20	51 51.4 3.7
Oct. 8	52.64 0.03	52 53.3 0.2	47.44 0.34	51 55.1 3.4
18	52.61 0.06	52 53.5 0.1	47.10 0.46	51 58.5 3.0
28	52.55 0.08	52 53.6 0.2	46.64 0.57	52 1.5 2.7
Nov. 7	52.47 0.09	52 53.4 0.3	46.07 0.66	52 4.2 2.3
17	52.38 0.11	52 53.1 0.5	45.41 0.74	52 6.5 1.8
27	52.27 0.11	52 52.6 0.6	44.67 0.81	52 8.3 1.2
Dec. 7	52.16 0.11	52 52.0 0.6	43.86 0.84	52 9.5 0.6
17	52.05 0.10	52 51.4 0.7	43.02 0.86	52 10.1 0.0
27	51.95 0.09	52 50.7 0.8	42.16 0.83	52 10.1 0.6
37	51.86	52 49.9	41.33	52 9.5

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

TABLE GIVING THE CORRECTION OF THREE OF THE POLAR STARS
FOR TERMS OF NUTATION INVOLVING 2ϵ .

$\Delta\alpha - 180^\circ$	51 Cephei.		σ Octania.		λ Urs. Min.		$\Delta\alpha - 180^\circ$		$\Delta\alpha - 180^\circ$	51 Cephei.		σ Octania.		λ Urs. Min.		$\Delta\alpha - 180^\circ$
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.				R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	
0	+.018	+.09	-.025	-.09	-.159	-.08	90		45	-.122	+.01	-.436	+.01	+.224	-.04	135
1	.014	.09	.040	.09	.151	.08	91		46	.123	.00	.435	.01	.229	.04	136
2	.009	.09	.055	.09	.143	.08	92		47	.124	.00	.433	.02	.234	.04	137
3	.005	.09	.070	.09	.135	.08	93		48	.124	+.00	.431	.02	.239	.04	138
4	+.001	.09	.085	.09	.127	.08	94		49	.124	-.01	.428	.02	.244	.04	139
5	-.003	+.09	-.100	-.09	-.118	-.08	95		50	-.124	-.01	-.425	+.02	+.249	-.03	140
6	.008	.09	.115	.08	.109	.08	96		51	.123	.01	.421	.03	.253	.03	141
7	.012	.09	.130	.08	.100	.08	97		52	.123	.02	.417	.03	.256	.03	142
8	.017	.09	.144	.08	.091	.08	98		53	.122	.02	.412	.03	.259	.02	143
9	.021	.09	.158	.08	.082	.08	99		54	.122	.02	.407	.04	.252	.02	144
10	-.025	+.09	-.172	-.08	-.073	-.09	100		55	-.121	-.02	-.401	+.04	+.255	-.02	145
11	.029	.09	.186	.08	.064	.09	101		56	.121	.03	.395	.04	.267	.02	146
12	.033	.09	.200	.08	.055	.09	102		57	.120	.03	.389	.04	.269	.01	147
13	.037	.08	.213	.08	.046	.09	103		58	.119	.03	.382	.05	.271	.01	148
14	.041	.08	.226	.08	.036	.09	104		59	.117	.04	.374	.05	.273	-.01	149
15	-.045	+.08	-.239	-.08	-.036	-.09	105		60	-.115	-.04	-.365	+.05	+.274	+.00	150
16	.049	.08	.251	.07	.017	.09	106		61	.114	.04	.356	.05	.275	.00	151
17	.053	.08	.263	.07	-.008	.09	107		62	.112	.04	.347	.06	.275	.00	152
18	.056	.08	.275	.07	+.002	.09	108		63	.110	.05	.338	.06	.275	.01	153
19	.060	.08	.287	.07	.012	.09	109		64	.108	.05	.328	.06	.275	.01	154
20	-.065	+.08	-.299	-.07	+.022	-.09	110		65	-.106	-.05	-.318	+.06	+.275	+.01	155
21	.069	.07	.310	.07	.032	.09	111		66	.102	.06	.307	.07	.274	.02	156
22	.073	.07	.320	.06	.041	.09	112		67	.100	.06	.296	.07	.272	.02	157
23	.076	.07	.330	.06	.050	.08	113		68	.098	.06	.284	.07	.270	.02	158
24	.079	.07	.340	.06	.060	.08	114		69	.095	.06	.272	.07	.268	.02	159
25	-.082	+.07	-.350	-.06	+.070	-.08	115		70	-.093	-.06	-.261	+.07	+.266	+.03	160
26	.085	.06	.359	.05	.079	.08	116		71	.090	.07	.249	.08	.263	.03	161
27	.088	.06	.368	.05	.088	.08	117		72	.087	.07	.237	.08	.260	.03	162
28	.091	.06	.376	.05	.097	.08	118		73	.084	.07	.224	.08	.257	.04	163
29	.094	.05	.383	.04	.106	.08	119		74	.080	.07	.211	.08	.254	.04	164
30	-.097	+.05	-.390	-.04	+.115	-.08	120		75	-.077	-.07	-.197	+.08	+.250	+.04	165
31	.100	.05	.396	.04	.124	.08	121		76	.074	.08	.183	.09	.246	.04	166
32	.103	.05	.402	.03	.133	.08	122		77	.070	.08	.169	.09	.242	.05	167
33	.105	.04	.408	.03	.142	.07	123		78	.066	.08	.155	.09	.237	.05	168
34	.107	.04	.413	.03	.150	.07	124		79	.062	.08	.141	.09	.232	.05	169
35	-.109	+.04	-.418	-.02	+.158	-.07	125		80	-.059	-.08	-.126	+.09	+.227	+.06	170
36	.111	.04	.423	.02	.165	.07	126		81	.055	.08	.111	.09	.221	.06	171
37	.113	.03	.427	.02	.172	.06	127		82	.050	.08	.096	.09	.215	.06	172
38	.115	.03	.430	.01	.179	.06	128		83	.047	.09	.081	.09	.209	.06	173
39	.116	.03	.432	+.01	.186	.06	129		84	.043	.09	.066	.09	.203	.06	174
40	-.117	+.03	-.434	+.01	+.193	-.06	130		85	-.039	-.09	-.051	+.09	+.196	+.07	175
41	.118	.02	.435	.00	.199	.05	131		86	.035	.09	.036	.09	.189	.07	176
42	.119	.02	.436	.00	.206	.05	132		87	.030	.09	.021	.09	.182	.07	177
43	.120	.01	.436	.00	.212	.05	133		88	.026	.09	-.006	.09	.175	.07	178
44	.121	.01	.436	.00	.218	.05	134		89	.022	.09	+.009	.09	.167	.07	179
45	.122	.01	.436	+.01	+.224	-.04	135		90	-.018	-.09	+.025	+.09	+.159	+.08	180

NOTE. — When the Argument is on the right-hand side of the Table, the sign of the correction is to be reversed.

SOLAR EPHEMERIS, 1861. 299

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi- diameter at Apparent Noon.	Sidereal Time of Semi-d. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascen- sion.	Declina- tion.						
Jan. 1	^h 18 ^m 49 ^s 23.55	24.31	[°] 22 ['] 58 ["] 20.8	19.9	11.030	13.00	+ 4	^m 4.18	16' 18.42	^m 11.07	^h 18 ^m 45 ^s 19.45	
2	18 53 48.11	48.95	22 52 54.9	53.9	11.016	14.15	4	32.18	18.41	11.01	18 49 15.99	
3	18 58 12.31	13.23	22 47 1.6	0.4	11.001	15.29	4	59.83	18.39	10.96	18 53 12.55	
4	19 2 36.14	37.14	22 40 41.0	39.6	10.984	16.42	5	27.11	18.37	10.91	18 57 9.11	
5	19 6 59.56	60.64	22 33 53.4	51.8	10.967	17.54	5	53.98	18.33	10.86	19 1 5.67	
6	19 11 22.53	23.69	22 26 39.0	37.2	10.948	18.65	6	20.40	18.30	10.78	19 5 2.22	
7	19 15 45.03	46.27	22 18 58.0	55.9	10.928	19.75	6	46.35	18.26	10.71	19 8 58.78	
8	19 20 7.04	8.36	22 10 50.7	48.3	10.906	20.85	7	11.80	18.22	10.64	19 12 55.34	
9	19 24 28.52	29.90	22 2 17.3	14.6	10.884	21.93	7	36.74	18.18	10.57	19 16 51.89	
10	19 28 49.44	50.89	21 53 17.9	14.9	10.860	23.00	8	1.12	18.14	10.50	19 20 48.46	
11	19 33 9.78	11.30	21 43 52.9	49.6	10.835	24.06	8	24.91	18.09	10.41	19 24 45.02	
12	19 37 29.51	31.10	21 33 52.6	59.0	10.809	25.10	8	48.07	18.03	10.33	19 28 41.57	
13	19 41 48.60	50.25	21 23 47.4	43.5	10.782	26.14	9	10.60	17.97	10.24	19 32 38.13	
14	19 46 7.03	8.74	21 13 7.4	3.2	10.754	27.16	9	32.47	17.91	10.15	19 36 34.69	
15	19 50 24.78	26.55	21 1 63.0	58.4	10.725	28.17	9	53.67	17.84	10.06	19 40 31.25	
16	19 54 41.83	43.66	20 50 34.7	29.8	10.695	29.17	10	14.17	17.76	9.96	19 44 27.80	
17	19 58 58.15	60.03	20 38 42.7	37.5	10.665	30.15	10	33.93	17.68	9.86	19 48 24.36	
18	20 3 13.73	15.66	20 26 27.3	21.8	10.633	31.12	10	52.95	17.60	9.76	19 52 20.92	
19	20 7 28.56	30.54	20 13 48.8	3.0	10.602	32.07	11	11.24	17.52	9.66	19 56 17.47	
20	20 11 42.62	44.64	20 0 47.7	41.5	10.570	33.01	11	28.74	17.43	9.56	20 0 14.03	
21	20 15 55.89	57.95	19 47 24.3	17.7	10.537	33.93	11	45.45	17.33	9.45	20 4 10.59	
22	20 20 8.37	10.47	19 33 38.9	31.9	10.503	34.84	12	1.37	17.23	9.34	20 8 7.15	
23	20 24 20.05	22.19	19 19 31.8	24.5	10.470	35.74	12	16.50	17.13	9.23	20 12 3.70	
24	20 28 30.93	33.11	19 4 63.5	55.9	10.436	36.61	12	30.81	17.01	9.12	20 16 0.26	
25	20 32 41.01	43.22	18 50 14.4	6.5	10.403	37.47	12	44.31	16.89	9.01	20 19 56.82	
26	20 36 50.30	52.54	18 34 64.7	56.5	10.370	38.33	12	57.05	16.76	8.90	20 23 53.37	
27	20 40 58.79	61.05	18 19 34.7	26.2	10.336	39.17	13	8.98	16.63	8.79	20 27 49.93	
28	20 45 6.45	8.73	18 3 44.9	36.1	10.302	39.98	13	20.08	16.50	8.67	20 31 46.49	
29	20 49 13.29	15.59	17 47 35.7	26.6	10.269	40.78	13	30.36	16.37	8.55	20 35 43.04	
30	20 53 19.33	21.65	17 30 67.4	58.0	10.235	41.57	13	39.82	16.22	8.43	20 39 39.60	
31	20 57 24.56	26.90	17 14 20.4	10.7	10.201	42.34	13	48.50	16.06	8.33	20 43 36.15	
Feb. 1	21 1 28.99	31.35	16 57 15.1	5.1	10.168	43.10	13	56.36	15.90	8.22	20 47 32.71	
2	21 5 32.62	34.99	16 39 51.9	41.6	10.135	43.83	14	3.42	15.74	8.10	20 51 29.27	
3	21 9 35.45	37.83	16 22 11.2	0.7	10.101	44.55	14	9.68	15.58	7.98	20 55 25.83	
4	21 13 37.47	39.86	16 4 13.4	2.7	10.068	45.25	14	15.14	15.41	7.86	20 59 22.38	
5	21 17 38.69	41.09	15 45 58.9	48.0	10.034	45.93	14	19.80	15.24	7.74	21 3 18.93	
6	21 21 39.11	41.51	15 27 28.2	17.1	10.001	46.60	14	23.66	15.06	7.63	21 7 15.49	
7	21 25 38.75	41.15	15 8 41.7	30.4	9.968	47.24	14	26.73	14.88	7.52	21 11 12.05	
8	21 29 37.60	40.00	14 49 39.8	28.3	9.935	47.88	14	29.02	14.70	7.41	21 15 8.60	
9	21 33 35.66	38.06	14 30 23.0	11.3	9.903	48.50	14	30.50	14.52	7.30	21 19 5.16	
10	21 37 32.93	35.33	14 10 51.7	39.8	9.870	49.09	14	31.22	14.33	7.19	21 23 1.71	
11	21 41 29.43	31.82	13 50 56.3	54.3	9.837	49.68	14	31.14	14.14	7.08	21 26 58.27	
12	21 45 25.16	27.54	13 30 57.3	55.2	9.806	50.24	14	30.31	13.95	6.97	21 30 54.82	
13	21 49 20.12	22.49	13 10 55.1	42.9	9.774	50.77	14	28.71	13.76	6.86	21 34 51.38	
14	21 53 14.33	16.68	12 50 30.3	18.0	9.743	51.29	14	26.36	13.57	6.75	21 38 47.93	
15	21 57 7.78	10.11	12 29 53.1	40.7	9.712	51.79	14	23.27	13.37	6.64	21 42 44.48	
16	22 1 0.49	2.80	12 8 64.0	51.5	9.681	52.28	14	19.42	13.17	6.54	21 46 41.04	
17	22 4 52.47	54.76	11 47 53.5	50.9	9.651	52.75	14	14.84	12.96	6.44	21 50 37.59	
18	22 8 43.74	46.01	11 26 52.0	39.4	9.622	53.21	14	9.54	12.75	6.34	21 54 34.15	
19	22 12 34.33	36.58	11 5 29.8	17.2	9.594	53.65	14	3.57	12.53	6.24	21 58 30.70	
20	22 16 24.26	26.49	10 43 57.4	44.8	9.566	54.07	13	56.94	12.31	6.15	22 2 27.26	
21	22 20 13.51	15.71	10 22 15.2	2.6	9.538	54.45	13	49.64	12.09	6.06	22 6 23.81	
22	22 24 2.10	4.27	10 0 23.6	11.0	9.511	54.84	13	41.66	11.87	5.97	22 10 20.37	
23	22 27 50.05	52.19	9 38 22.9	10.4	9.484	55.21	13	33.05	11.65	5.88	22 14 16.92	
24	22 31 37.38	39.49	9 16 13.4	1.0	9.459	55.56	13	23.83	11.42	5.79	22 18 13.47	
25	22 35 24.10	26.18	8 53 55.6	43.3	9.434	55.91	13	13.99	11.18	5.71	22 22 10.03	
26	22 39 10.25	12.30	8 31 29.9	17.7	9.411	56.23	13	3.59	10.94	5.63	22 26 6.58	
27	22 42 55.86	57.88	8 8 56.6	44.5	9.390	56.53	12	52.65	10.70	5.55	22 30 3.13	
28	22 46 40.96	42.94	7 46 16.1	4.1	9.369	56.83	12	41.19	10.46	5.47	22 33 59.69	
29	22 50 25.56	27.50	7 23 28.8	16.9	9.348	57.11	12	29.22	10.21	5.40	22 37 56.24	
30	22 54 9.67	11.58	7 0 35.1	23.3	9.328	57.36	12	16.77	9.95	5.33	22 41 52.80	
31	22 57 53.32	55.20	6 37 35.4	23.7	9.308	57.60	+12	3.86	16 9.69	5.26	22 45 49.35	

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sideral Interval.

300 SOLAR EPHEMERIS, 1861.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semi-d. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
Mar. 1	22 50 25.56	27.50	7 23 28.8	16.9	9.348	57.11	+12 29.22	16' 10.21	5.40	22 37 56.94
2	22 54 9.67	11.58	7 0 35.1	23.3	9.328	57.36	12 16.77	9.95	5.33	22 41 52.80
3	22 57 53.32	55.90	6 37 35.4	23.7	9.308	57.60	12 3.86	9.69	5.26	22 45 49.35
4	23 1 36.53	38.37	6 14 30.1	18.6	9.291	57.83	11 50.52	9.43	5.19	22 49 45.90
5	23 5 19.30	21.10	5 51 19.4	8.1	9.274	58.05	11 36.73	9.17	5.12	22 53 42.46
6	23 9 1.67	3.43	5 27 63.8	52.7	9.257	58.24	11 22.55	8.91	5.06	22 57 39.01
7	23 12 43.64	45.36	5 4 43.8	32.9	9.241	58.42	11 7.98	8.65	5.00	23 1 35.56
8	23 16 25.23	26.91	4 41 19.7	9.0	9.225	58.58	10 53.00	8.39	4.94	23 5 32.12
9	23 20 6.47	8.11	4 17 52.0	41.5	9.211	58.73	10 37.69	8.13	4.89	23 9 28.67
10	23 23 47.38	48.98	3 54 21.0	10.7	9.197	58.85	10 22.05	7.86	4.84	23 13 25.22
11	23 27 27.96	29.52	3 30 47.2	37.2	9.184	58.96	10 16.06	7.59	4.79	23 17 21.78
12	23 31 8.24	9.76	3 7 10.9	1.1	9.171	59.05	9 49.79	7.33	4.75	23 21 18.33
13	23 34 48.22	49.70	2 43 32.6	23.1	9.160	59.13	9 33.22	7.07	4.71	23 25 14.88
14	23 38 27.93	29.36	2 19 52.7	43.5	9.149	59.19	9 16.38	6.80	4.67	23 29 11.43
15	23 42 7.39	8.77	1 56 11.5	2.6	9.139	59.23	8 59.29	6.53	4.63	23 33 7.99
16	23 45 46.61	47.94	1 32 29.5	20.9	9.129	59.25	8 41.97	6.26	4.60	23 37 4.54
17	23 49 25.61	26.90	1 8 47.0	38.6	9.120	59.27	8 24.42	6.00	4.58	23 41 1.09
18	23 53 4.41	5.65	0 44 64.4	56.3	9.113	59.27	8 6.66	5.73	4.56	23 44 57.65
19	23 56 43.02	44.21	0 21 22.0	14.2	9.106	59.24	7 48.72	5.46	4.54	23 48 54.20
20	0 0 21.48	22.62	+ 0 2 19.8	27.3	9.100	59.21	7 30.63	5.19	4.52	23 52 50.75
21	0 3 59.80	60.89	0 26 0.6	7.8	9.094	59.17	7 12.41	4.93	4.50	23 56 47.31
22	0 7 38.01	39.05	0 49 40.1	47.0	9.089	59.12	6 54.07	4.66	4.49	0 0 43.86
23	0 11 16.11	17.10	1 13 18.0	24.6	9.086	59.05	6 35.62	4.39	4.48	0 4 40.41
24	0 14 54.14	56.08	1 36 53.9	60.2	9.084	58.96	6 17.10	4.12	4.47	0 8 36.97
25	0 18 32.13	32.03	2 0 27.5	23.5	9.082	58.84	5 58.54	3.84	4.46	0 12 33.51
26	0 22 10.10	10.96	2 23 58.5	64.1	9.082	58.72	5 39.97	3.56	4.46	0 16 30.07
27	0 25 48.06	48.87	2 47 26.6	31.8	9.082	58.60	5 21.30	3.28	4.46	0 20 26.62
28	0 29 26.04	26.80	3 10 51.5	56.4	9.083	58.46	5 2.82	3.00	4.46	0 24 23.18
29	0 33 4.08	4.79	3 34 12.7	17.3	9.086	58.30	4 44.30	2.72	4.47	0 28 19.73
30	0 36 42.18	42.85	3 57 30.0	34.3	9.089	58.13	4 25.86	2.44	4.48	0 32 16.28
31	0 40 20.38	21.01	4 20 43.0	47.0	9.093	57.95	4 7.51	2.15	4.49	0 36 12.84
Apr. 1	0 43 58.69	59.27	4 43 51.4	55.1	9.098	57.75	3 49.27	1.86	4.51	0 40 9.30
2	0 47 37.13	37.66	5 6 54.8	58.2	9.104	57.53	3 31.16	1.57	4.53	0 44 5.94
3	0 51 15.73	16.21	5 29 52.9	56.0	9.112	57.30	3 13.21	1.29	4.55	0 48 2.50
4	0 54 54.50	54.94	5 52 45.4	48.2	9.120	57.06	2 55.44	1.01	4.57	0 51 59.05
5	0 58 33.46	33.86	6 15 31.9	34.5	9.128	56.81	2 37.86	0.73	4.60	0 55 55.60
6	1 2 12.62	12.97	6 38 12.0	14.3	9.136	56.54	2 20.45	0.45	4.63	0 59 52.16
7	1 5 52.00	52.31	7 0 45.3	47.3	9.145	56.25	2 3.28	0.17	4.66	1 3 48.71
8	1 9 31.62	31.89	7 23 11.5	13.2	9.155	55.93	1 46.35	15 59.89	4.69	1 7 45.26
9	1 13 11.50	11.73	7 45 30.2	31.6	9.166	55.61	1 29.66	59.62	4.73	1 11 41.82
10	1 16 51.64	51.83	8 7 41.1	42.3	9.178	55.29	1 13.26	59.35	4.77	1 15 38.37
11	1 20 32.06	32.21	8 29 43.8	44.7	9.190	54.93	0 57.14	59.08	4.81	1 19 34.92
12	1 24 12.77	12.88	8 51 37.9	38.5	9.202	54.57	0 41.30	58.81	4.86	1 23 31.48
13	1 27 53.78	53.85	9 13 23.1	23.5	9.215	54.19	0 25.75	58.54	4.91	1 27 28.03
14	1 31 35.11	35.14	9 34 59.0	59.2	9.229	53.79	+ 0 10.52	58.28	4.96	1 31 24.59
15	1 35 16.77	16.76	9 56 25.3	25.3	9.243	53.38	- 0 4.37	58.02	5.01	1 35 21.14
16	1 38 58.77	58.72	10 17 41.7	41.5	9.257	52.97	0 18.93	57.76	5.06	1 39 17.69
17	1 42 41.13	41.04	10 38 47.9	47.5	9.273	52.53	0 33.13	57.50	5.12	1 43 14.25
18	1 46 23.87	23.74	10 59 43.4	42.8	9.289	52.08	0 46.94	57.24	5.18	1 47 10.80
19	1 50 6.99	6.83	11 20 28.0	27.2	9.305	51.62	1 0.38	56.98	5.24	1 51 7.36
20	1 53 50.51	50.32	11 41 1.3	0.3	9.322	51.15	1 13.40	56.73	5.30	1 55 3.91
21	1 57 34.45	34.22	12 1 23.1	21.9	9.340	50.66	1 26.02	56.48	5.36	1 59 0.47
22	2 1 18.82	18.56	12 21 33.1	31.7	9.358	50.16	1 38.19	56.23	5.42	2 2 57.02
23	2 5 3.63	3.34	12 41 30.9	29.3	9.376	49.65	1 49.93	55.98	5.49	2 6 53.57
24	2 8 48.90	48.58	13 1 16.3	14.6	9.396	49.12	2 1.21	55.73	5.56	2 10 50.13
25	2 12 34.65	34.30	13 20 48.9	47.1	9.416	48.58	2 12.01	55.48	5.63	2 14 46.68
26	2 16 20.88	20.50	13 40 8.4	26.5	9.436	48.03	2 22.33	55.23	5.70	2 18 43.24
27	2 20 7.62	7.21	13 59 14.5	12.5	9.458	47.47	2 32.14	54.99	5.77	2 22 39.79
28	2 23 54.88	54.45	14 18 6.9	4.8	9.480	46.90	2 41.44	54.75	5.85	2 26 36.35
29	2 27 42.67	42.22	14 36 45.3	43.1	9.503	46.30	2 50.20	54.51	5.93	2 30 32.90
30	2 31 31.02	30.55	14 55 9.4	7.1	9.526	45.70	2 58.42	54.27	6.01	2 34 29.46
31	2 35 19.91	19.42	+15 13 18.9	16.5	9.549	45.08	- 3 6.09	15 54.03	6.09	2 38 26.01

NOTE. — For Mean Interval of Semi-diameter passing the Meridian, subtract 0.16 from the Sidereal Interval.

SOLAR EPHEMERIS, 1861. 301

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
	^h ^m ^s	^s	[°] ['] ^{''}	^{''}	^s	^{''}	^m ^s	['] ^{''}	^m ^s	^h ^m ^s
May 1	2 35 19.91	19.42	+15 13 18.9	16.5	9.549	45.08	- 3 6.09	15' 54.03	1 6.09	2 38 26.01
2	2 39 9.36	8.85	15 31 13.4	10.9	9.572	44.45	3 13.20	53.79	6.17	2 42 22.57
3	2 42 59.38	58.65	15 48 52.5	50.0	9.596	43.81	3 19.73	53.55	6.25	2 46 19.12
4	2 46 49.97	49.42	16 6 16.0	13.5	9.620	43.16	3 25.70	53.31	6.33	2 50 15.68
5	2 50 41.14	40.58	16 23 23.6	21.1	9.644	42.47	3 31.10	53.07	6.41	2 54 12.24
6	2 54 32.88	32.30	16 40 15.0	12.5	9.668	41.79	3 35.90	52.84	6.49	2 58 8.79
7	2 58 25.20	24.61	16 56 49.8	47.3	9.692	41.10	3 40.13	52.62	6.57	3 2 5.35
8	3 2 18.10	17.50	17 13 7.7	5.2	9.716	40.39	3 43.78	52.40	6.65	3 6 1.90
9	3 6 11.58	10.97	17 29 8.4	5.9	9.740	39.66	3 46.87	52.19	6.73	3 9 58.46
10	3 10 5.64	5.02	17 44 51.5	49.0	9.764	38.92	3 49.37	51.98	6.81	3 13 55.01
11	3 13 50.27	59.64	18 0 16.7	14.2	9.788	38.17	3 51.30	51.78	6.91	3 17 51.57
12	3 17 55.47	54.83	18 15 23.8	21.3	9.812	37.42	3 52.67	51.58	6.99	3 21 48.13
13	3 21 51.23	50.59	18 30 12.5	10.0	9.836	36.64	3 53.45	51.38	7.07	3 25 44.68
14	3 25 47.55	46.91	18 44 42.5	40.1	9.858	35.85	3 53.68	51.18	7.15	3 29 41.23
15	3 29 44.43	43.79	18 58 53.5	51.2	9.881	35.06	3 53.36	50.99	7.23	3 33 37.79
16	3 33 41.85	41.21	19 12 45.1	42.8	9.904	34.24	3 52.50	50.80	7.31	3 37 34.35
17	3 37 39.82	39.69	19 26 17.2	15.2	9.927	33.42	3 51.09	50.62	7.39	3 41 30.91
18	3 41 38.33	37.18	19 39 39.6	27.5	9.949	32.60	3 49.13	50.44	7.47	3 45 27.46
19	3 45 37.38	36.75	19 52 22.0	20.0	9.972	31.76	3 46.64	50.26	7.55	3 49 24.02
20	3 49 36.96	36.34	20 4 54.1	52.2	9.994	30.91	3 43.63	50.08	7.63	3 53 20.58
21	3 53 37.07	36.45	20 17 5.6	3.7	10.015	30.05	3 40.08	49.91	7.71	3 57 17.14
22	3 57 37.70	37.09	20 28 56.3	55.5	10.036	29.18	3 36.00	49.74	7.78	4 1 13.69
23	4 1 38.84	38.24	20 40 26.1	24.4	10.057	28.30	3 31.42	49.57	7.85	4 5 10.25
24	4 5 40.50	39.21	20 51 34.7	33.1	10.079	27.41	3 26.33	49.41	7.92	4 9 6.81
25	4 9 42.66	42.09	21 2 21.9	20.4	10.100	26.52	3 20.72	49.25	7.99	4 13 3.36
26	4 13 45.32	44.77	21 12 47.3	45.9	10.121	25.60	3 14.62	49.09	8.06	4 16 59.92
27	4 17 48.47	47.94	21 22 50.8	49.5	10.141	24.68	3 8.03	48.93	8.13	4 20 56.48
28	4 21 52.11	51.60	21 32 32.3	31.1	10.161	23.76	3 0.94	48.78	8.19	4 24 53.03
29	4 25 56.24	55.75	21 41 51.6	50.5	10.180	22.83	2 53.38	48.63	8.25	4 28 49.59
30	4 30 0.81	0.24	21 50 48.3	47.3	10.199	21.89	2 45.37	48.48	8.31	4 32 46.15
31	4 34 5.82	5.37	21 59 22.3	21.4	10.218	20.93	2 36.92	48.34	8.37	4 36 42.71
June 1	4 38 11.26	10.83	22 7 33.3	32.5	10.236	19.97	2 28.04	48.20	8.43	4 40 39.27
2	4 42 17.12	16.71	22 15 21.1	20.4	10.253	19.01	2 18.72	48.06	8.49	4 44 35.82
3	4 46 23.39	23.01	22 22 45.7	45.1	10.269	18.04	2 9.02	47.93	8.54	4 48 32.38
4	4 50 30.03	29.68	22 29 46.9	46.3	10.284	17.06	1 58.93	47.80	8.59	4 52 28.94
5	4 54 37.02	36.70	22 36 24.6	24.1	10.298	16.08	1 48.51	47.69	8.64	4 56 25.50
6	4 58 44.35	44.06	22 42 38.5	38.1	10.312	15.09	1 37.73	47.58	8.69	5 0 22.05
7	5 2 52.00	51.74	22 48 28.5	28.2	10.325	14.09	1 26.64	47.47	8.73	5 4 18.61
8	5 6 59.93	59.70	22 53 54.5	54.3	10.336	13.08	1 15.25	47.36	8.76	5 8 15.17
9	5 11 8.12	7.93	22 58 56.3	56.1	10.346	12.07	1 3.62	47.25	8.80	5 12 11.73
10	5 15 16.55	16.89	23 3 33.9	33.8	10.355	11.06	0 51.76	47.16	8.83	5 16 8.29
11	5 19 25.19	25.06	23 7 47.1	47.1	10.364	10.05	0 39.69	47.07	8.86	5 20 4.85
12	5 23 34.02	33.92	23 11 35.9	35.9	10.371	9.03	0 27.41	46.98	8.88	5 24 1.40
13	5 27 43.01	42.95	23 15 0.2	0.2	10.377	8.01	0 14.97	46.90	8.90	5 27 57.96
14	5 31 52.14	52.12	23 18 0.0	0.0	10.383	6.98	0 2.40	46.83	8.92	5 31 54.52
15	5 36 1.38	1.41	23 20 35.2	35.2	10.388	5.95	+ 0 10.29	46.76	8.94	5 35 51.08
16	5 40 10.72	10.79	23 22 45.6	45.6	10.390	4.92	0 23.08	46.70	8.95	5 39 47.64
17	5 44 20.12	20.23	23 24 31.3	31.3	10.392	3.89	0 35.93	46.64	8.96	5 43 44.19
18	5 48 29.56	29.71	23 25 52.3	52.3	10.394	2.86	0 48.82	46.58	8.97	5 47 40.75
19	5 52 39.02	39.20	23 26 48.6	48.6	10.394	1.83	1 1.72	46.52	8.98	5 51 37.31
20	5 56 48.48	48.70	23 27 20.2	20.2	10.394	0.80	1 14.62	46.47	8.98	5 55 33.87
21	6 0 57.93	58.19	23 27 26.9	26.9	10.394	0.24	1 27.51	46.42	8.98	5 59 30.43
22	6 5 7.36	7.66	23 27 8.8	8.8	10.391	1.27	1 40.39	46.37	8.97	6 3 26.98
23	6 9 16.73	17.06	23 26 26.0	26.0	10.388	2.30	1 53.21	46.33	8.96	6 7 23.54
24	6 13 26.02	26.38	23 25 18.4	18.3	10.385	3.33	2 5.94	46.29	8.95	6 11 20.10
25	6 17 35.21	35.61	23 23 46.1	46.1	10.380	4.36	2 18.56	46.26	8.93	6 15 16.66
26	6 21 44.28	44.72	23 21 49.2	49.1	10.375	5.39	2 31.07	46.23	8.91	6 19 13.22
27	6 25 53.22	53.70	23 19 27.7	27.5	10.370	6.40	2 43.45	46.20	8.89	6 23 9.78
28	6 30 2.02	2.53	23 16 41.6	41.3	10.363	7.42	2 55.71	46.18	8.86	6 27 6.33
29	6 34 10.64	11.18	23 13 30.9	30.5	10.355	8.46	3 7.77	46.16	8.83	6 31 2.89
30	6 38 19.06	19.64	23 9 55.7	55.2	10.346	9.47	3 19.62	46.15	8.80	6 34 59.45
31	6 42 27.26	27.87	+23 5 56.2	55.6	10.336	10.48	+ 3 31.26	15 46.14	8.77	6 38 56.01

NOTE.—For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

302 SOLAR EPHEMERIS, 1861.

AT WASHINGTON MEAN AND APPARENT NOON.												
Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.		
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.						
July 1	h m s	s	+23° 5' 56.2"	55.6	10.336	10.48	+ 3 31.26	15' 46.14	1 8.77	h m s	6 38 56.01	
2	6 42 27.26	27.87	23 1 32.4	31.7	10.326	11.49	3 42.66	46.13	8.73	6 42 52.57		
3	6 46 35.22	35.86	22 56 44.4	43.6	10.314	11.50	3 53.82	46.12	8.69	6 46 49.12		
4	6 50 42.92	43.59	22 51 32.4	31.5	10.302	13.50	4 4.69	46.12	8.65	6 50 45.68		
5	6 54 50.34	51.04	22 45 56.5	55.5	10.289	14.49	4 15.23	46.13	8.60	6 54 42.24		
6	6 58 57.44	58.17	22 39 56.8	55.7	10.275	15.48	4 25.43	46.15	8.55	6 58 38.80		
7	7 3 4.20	4.96	22 33 33.5	32.3	10.260	16.46	4 35.28	46.17	8.50	7 2 35.36		
8	7 7 10.61	11.40	22 26 46.7	45.4	10.242	17.44	4 44.76	46.20	8.45	7 6 31.91		
9	7 11 16.64	17.46	22 19 36.7	35.2	10.225	18.40	4 53.83	46.23	8.39	7 10 28.47		
10	7 15 22.27	23.11	22 12 3.6	1.9	10.207	19.35	5 2.46	46.27	8.33	7 14 25.03		
11	7 19 27.47	28.34	22 4 7.6	5.7	10.188	20.30	5 10.65	46.31	8.27	7 18 21.59		
12	7 23 32.23	33.12	21 55 48.8	46.8	10.170	21.24	5 18.41	46.35	8.21	7 22 18.14		
13	7 27 36.54	37.46	21 47 7.6	5.5	10.150	22.18	5 26.69	46.40	8.15	7 26 14.70		
14	7 31 40.37	41.29	21 38 4.2	2.0	10.128	23.10	5 32.46	46.46	8.08	7 30 11.26		
15	7 35 43.70	44.65	21 28 38.7	36.4	10.107	24.02	5 38.71	46.52	8.01	7 34 7.82		
16	7 39 46.51	47.47	21 18 51.3	48.9	10.084	24.92	5 44.44	46.59	7.94	7 38 4.38		
17	7 43 48.80	49.77	21 8 42.3	39.8	10.062	25.82	5 49.66	46.66	7.86	7 42 0.93		
18	7 47 50.56	51.54	20 58 11.8	9.2	10.039	26.71	5 54.32	46.74	7.78	7 45 57.49		
19	7 51 51.78	52.77	20 47 20.1	17.4	10.016	27.59	5 58.42	46.82	7.70	7 49 54.05		
20	7 55 52.45	53.45	20 36 7.4	4.5	9.993	28.46	6 1.95	46.90	7.62	7 53 50.60		
21	7 59 52.56	53.56	20 24 33.9	30.9	9.969	29.32	6 4.93	47.09	7.54	7 57 47.16		
22	8 3 52.10	53.10	20 12 39.9	36.8	9.945	30.16	6 7.35	47.18	7.46	8 1 43.72		
23	8 7 51.08	52.08	20 0 25.7	22.5	9.922	31.01	6 9.90	47.27	7.38	8 5 40.28		
24	8 11 49.49	50.50	19 47 51.4	48.1	9.898	31.84	6 10.48	47.26	7.30	8 9 36.83		
25	8 15 47.32	48.34	19 34 57.2	53.8	9.874	32.67	6 11.18	47.36	7.22	8 13 33.39		
26	8 19 44.57	45.58	19 21 43.4	39.9	9.850	33.48	6 11.30	47.46	7.14	8 17 29.95		
27	8 23 41.24	42.35	19 8 10.4	6.8	9.826	34.29	6 10.84	47.56	7.05	8 21 26.50		
28	8 27 37.34	38.34	18 54 18.3	14.7	9.802	35.06	6 9.79	47.66	6.96	8 25 23.06		
29	8 31 32.86	33.85	18 40 7.4	3.8	9.777	35.83	6 8.18	47.77	6.87	8 29 19.61		
30	8 35 27.80	28.78	18 25 38.0	34.3	9.752	36.60	6 5.97	47.89	6.79	8 33 16.17		
31	8 39 22.15	23.12	18 10 50.3	46.5	9.728	37.36	6 3.17	48.01	6.71	8 37 12.73		
Aug. 1	8 43 15.91	16.87	17 55 44.6	40.8	9.703	38.11	5 59.78	48.13	6.62	8 41 9.28		
2	8 47 9.08	10.03	17 40 21.3	17.5	9.679	38.83	5 55.81	48.25	6.53	8 45 5.84		
3	8 51 1.67	2.61	17 24 40.7	36.9	9.655	39.54	5 51.94	48.38	6.44	8 49 2.40		
4	8 54 53.67	54.60	17 8 43.0	39.2	9.630	40.25	5 46.06	48.51	6.35	8 52 58.95		
5	8 58 45.07	45.99	16 52 28.6	24.8	9.605	40.94	5 40.33	48.65	6.26	8 56 55.51		
6	9 2 35.87	36.78	16 35 57.8	54.0	9.580	41.61	5 33.99	48.80	6.17	9 0 52.06		
7	9 6 26.09	26.98	16 19 10.9	7.1	9.556	42.28	5 27.07	48.95	6.09	9 4 48.62		
8	9 10 15.73	16.60	16 2 8.3	4.5	9.531	42.92	5 19.56	49.12	6.01	9 8 45.17		
9	9 14 4.77	5.62	15 44 50.3	46.5	9.507	43.56	5 11.46	49.29	5.92	9 12 41.73		
10	9 17 53.22	54.05	15 27 17.2	13.4	9.482	44.18	5 2.77	49.46	5.84	9 16 38.28		
11	9 21 41.08	41.88	15 9 29.3	25.5	9.458	44.80	4 53.49	49.63	5.76	9 20 34.84		
12	9 25 28.35	29.12	14 51 26.9	23.2	9.434	45.39	4 43.63	49.80	5.68	9 24 31.40		
13	9 29 15.05	15.79	14 33 10.3	6.8	9.411	45.98	4 33.21	49.98	5.60	9 28 27.95		
14	9 33 1.18	1.89	14 14 39.9	36.5	9.387	46.55	4 22.22	50.19	5.52	9 32 24.51		
15	9 36 46.75	47.43	13 55 56.1	52.8	9.364	47.10	4 10.68	50.36	5.44	9 36 21.06		
16	9 40 31.77	32.42	13 36 59.1	55.9	9.342	47.65	3 58.60	50.55	5.37	9 40 17.61		
17	9 44 16.24	16.86	13 17 49.1	46.0	9.321	48.18	3 45.99	50.74	5.30	9 44 14.17		
18	9 48 0.19	0.78	12 58 26.5	23.6	9.300	48.70	3 32.87	50.93	5.23	9 48 10.73		
19	9 51 43.62	44.17	12 38 51.6	48.8	9.279	49.21	3 19.26	51.12	5.16	9 52 7.98		
20	9 55 26.55	27.07	12 19 4.6	2.0	9.259	49.70	3 5.16	51.32	5.09	9 56 3.83		
21	9 59 8.99	9.47	11 59 5.9	3.5	9.239	50.19	2 50.57	51.52	5.02	10 0 0.39		
22	10 2 50.97	51.41	11 38 55.7	53.5	9.220	50.67	2 35.54	51.72	4.95	10 3 56.94		
23	10 6 32.49	32.89	11 18 34.4	32.4	9.202	51.12	2 20.05	51.92	4.89	10 7 53.50		
24	10 10 13.57	13.93	10 58 2.2	0.4	9.185	51.55	2 4.15	52.13	4.83	10 11 50.05		
25	10 13 54.23	54.55	10 37 19.5	17.9	9.169	51.99	1 47.86	52.34	4.77	10 15 46.60		
26	10 17 34.49	34.77	10 16 26.5	25.1	9.153	52.42	1 31.19	52.55	4.71	10 19 43.16		
27	10 21 14.37	14.61	9 55 23.6	22.4	9.139	52.82	1 14.15	52.76	4.65	10 23 39.71		
28	10 24 53.88	54.07	9 34 11.1	10.2	9.125	53.21	0 56.75	52.98	4.60	10 27 36.27		
29	10 28 33.04	33.18	9 12 49.3	48.6	9.110	53.60	0 39.02	53.20	4.55	10 31 32.82		
30	10 32 11.85	11.95	8 51 18.6	18.2	9.097	53.96	0 20.96	53.42	4.50	10 35 29.37		
31	10 35 50.33	50.39	+ 8 29 39.3	39.2	9.084	54.31	+ 0 2.59	53.64	4.45	10 39 25.93		

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

SOLAR EPHEMERIS, 1861. 303

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.			APPARENT DECLINATION.			HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.						
Sept. 1	h m s	h m s	h m s	h m s	h m s	h m s	m s	m s	m s	m s	m s	h m s
2	10 43 6.40	6.36	+ 8 7 51.6	51.8	9.073	54.65	0 16.08	15 53.87	1 4.40	10 43 22.48		
3	10 46 44.02	43.93	7 45 56.0	56.5	9.062	54.98	0 35.02	54.10	4.36	10 47 19.04		
4	10 50 21.37	21.94	7 23 52.8	53.6	9.051	55.28	0 54.22	54.34	4.32	10 51 15.59		
5	10 53 58.47	58.99	7 1 42.4	43.5	9.041	55.58	1 13.66	54.58	4.28	10 55 12.14		
6	10 57 35.34	35.11	6 39 25.1	26.5	9.032	55.86	1 33.36	54.82	4.24	10 59 8.70		
7	11 1 11.99	11.71	6 17 1.3	3.0	9.023	56.12	1 53.25	55.06	4.21	11 3 5.25		
8	11 4 48.42	48.09	5 54 31.3	33.3	9.014	56.37	2 13.35	55.31	4.19	11 7 1.80		
9	11 8 24.66	24.28	5 31 55.5	57.8	9.007	56.61	2 33.67	55.56	4.17	11 10 58.36		
10	11 12 0.72	0.29	5 9 14.1	16.7	9.000	56.82	2 54.17	55.82	4.15	11 14 54.91		
11	11 15 36.63	36.15	4 46 27.6	30.5	8.993	57.03	3 14.81	56.08	4.13	11 18 51.46		
12	11 19 12.40	11.87	4 23 36.3	39.6	8.988	57.23	3 35.58	56.34	4.11	11 22 48.02		
13	11 22 48.05	47.46	4 0 40.5	44.2	8.983	57.41	3 56.47	56.60	4.09	11 26 44.57		
14	11 26 23.59	23.95	3 37 40.6	44.6	8.979	57.57	4 17.47	56.86	4.08	11 30 41.12		
15	11 29 59.05	58.36	3 14 36.8	41.1	8.976	57.73	4 38.66	57.12	4.07	11 34 37.67		
16	11 33 34.45	33.71	2 51 29.5	34.1	8.974	57.87	4 59.72	57.39	4.06	11 38 34.22		
17	11 37 9.21	9.02	2 28 19.0	24.0	8.973	58.00	5 20.90	57.66	4.06	11 32 30.78		
18	11 40 45.15	44.30	2 5 5.6	11.0	8.972	58.11	5 42.10	57.93	4.06	11 36 27.33		
19	11 44 20.49	19.59	1 41 49.6	55.4	8.973	58.21	6 3.30	58.19	4.06	11 40 23.89		
20	11 47 55.26	54.91	1 18 31.3	37.5	8.975	58.30	6 24.48	58.45	4.07	11 54 20.44		
21	11 51 31.29	30.29	0 55 11.0	17.6	8.978	58.37	6 45.60	58.72	4.08	11 58 16.99		
22	11 55 6.79	5.73	0 31 49.1	56.0	8.981	58.44	7 6.65	58.99	4.09	12 2 13.55		
23	11 58 42.40	42.98	+ 0 8 25.8	33.0	8.986	58.49	7 27.59	59.26	4.11	12 6 10.10		
24	12 2 18.13	16.95	- 0 14 58.5	50.9	8.991	58.53	7 48.40	59.52	4.13	12 10 6.65		
25	12 5 54.01	53.78	0 38 23.5	15.5	8.998	58.55	8 9.07	59.79	4.15	12 14 3.20		
26	12 9 30.06	29.78	1 1 48.8	40.5	9.006	58.56	8 29.58	60.06	4.18	12 17 59.76		
27	12 13 6.30	4.97	1 25 14.1	5.5	9.015	58.55	8 49.89	60.33	4.21	12 21 56.31		
28	12 16 42.76	41.38	1 48 39.1	30.2	9.024	58.52	9 9.98	60.60	4.24	12 25 52.86		
29	12 20 19.45	18.02	2 11 63.4	54.2	9.034	58.48	9 29.83	60.87	4.27	12 29 49.42		
30	12 23 56.40	54.92	2 35 26.6	17.1	9.045	58.43	9 49.43	61.14	4.31	12 33 45.97		
Oct. 1	12 27 33.62	32.09	2 58 48.3	38.5	9.057	58.37	10 8.78	61.41	4.35	12 37 42.52		
2	12 31 11.13	9.85	3 21 68.2	58.1	9.069	58.29	10 27.79	61.68	4.39	12 41 39.07		
3	12 34 48.95	47.32	3 45 26.0	15.6	9.082	58.19	10 46.53	61.96	4.43	12 45 35.63		
4	12 38 27.09	25.41	4 8 41.2	30.5	9.096	58.07	11 4.94	62.23	4.48	12 49 32.18		
5	12 42 5.58	4.85	4 31 53.4	42.4	9.111	57.94	11 23.01	62.51	4.53	12 53 28.73		
6	12 45 44.43	43.65	4 54 62.2	50.9	9.126	57.79	11 40.72	62.79	4.58	12 57 25.29		
7	12 49 23.66	21.83	5 17 67.3	55.8	9.142	57.62	11 58.05	63.07	4.64	13 1 21.84		
8	12 53 3.27	1.40	5 40 68.3	56.6	9.159	57.45	12 14.99	63.35	4.70	13 5 18.39		
9	12 56 43.29	41.37	6 3 64.8	52.9	9.176	57.25	12 31.52	63.64	4.77	13 9 14.95		
10	13 0 23.74	21.77	6 26 56.5	44.4	9.194	57.05	12 47.62	63.92	4.84	13 13 11.50		
11	13 4 4.64	2.63	6 49 42.9	30.6	9.213	56.82	13 3.28	64.20	4.91	13 17 8.05		
12	13 7 45.99	43.94	7 12 23.7	11.2	9.232	56.58	13 18.49	64.48	4.98	13 21 4.61		
13	13 11 27.81	27.72	7 34 58.5	45.8	9.253	56.30	13 33.21	64.76	5.05	13 25 1.16		
14	13 15 10.13	8.00	7 57 26.9	14.0	9.275	56.03	13 47.44	65.04	5.14	13 28 57.72		
15	13 18 52.97	50.80	8 19 48.6	35.5	9.297	55.75	14 1.15	65.32	5.22	13 32 54.27		
16	13 22 36.35	34.14	8 41 63.2	50.0	9.319	55.45	14 14.31	65.60	5.30	13 36 50.82		
17	13 26 20.28	18.05	9 3 70.4	57.1	9.342	55.13	14 26.94	65.88	5.38	13 40 47.37		
18	13 30 4.79	2.50	9 25 69.7	56.3	9.366	54.81	14 39.00	66.16	5.47	13 44 43.93		
19	13 33 49.89	47.56	9 47 60.9	47.4	9.392	54.45	14 50.46	66.43	5.56	13 48 40.48		
20	13 37 35.61	33.24	10 9 43.6	30.0	9.419	54.09	15 1.30	66.70	5.65	13 52 37.03		
21	13 41 21.97	19.57	10 31 17.3	3.6	9.445	53.71	15 11.51	66.97	5.74	13 56 33.59		
22	13 45 8.98	6.55	10 52 41.7	28.0	9.473	53.31	15 21.06	67.24	5.83	14 0 30.14		
23	13 48 56.67	54.21	11 13 56.4	42.7	9.501	52.90	15 29.94	67.51	5.93	14 4 26.70		
24	13 52 45.06	42.57	11 34 61.1	47.4	9.531	52.48	15 38.11	67.78	6.03	14 8 23.25		
25	13 56 34.17	31.65	11 55 55.3	41.6	9.562	52.03	15 45.55	68.01	6.13	14 12 19.80		
26	14 0 24.01	21.47	12 16 38.7	25.0	9.592	51.57	15 52.26	68.26	6.23	14 16 16.36		
27	14 4 14.58	12.02	12 36 70.8	57.1	9.623	51.10	15 58.24	68.51	6.33	14 20 12.91		
28	14 8 5.90	3.32	12 57 31.3	17.7	9.654	50.60	16 3.51	68.76	6.45	14 24 9.47		
29	14 11 57.99	55.39	13 17 39.7	26.2	9.687	50.09	16 7.99	69.02	6.56	14 28 6.02		
30	14 15 50.87	43.25	13 37 35.6	22.2	9.720	49.55	16 11.68	69.27	6.67	14 32 2.58		
31	14 19 44.55	41.91	13 57 18.6	5.3	9.753	49.01	16 14.57	69.52	6.78	14 35 59.13		
32	14 23 39.02	36.37	14 16 48.2	35.0	9.787	48.44	16 16.66	69.77	6.89	14 39 55.69		
33	14 27 34.29	31.63	14 35 64.0	51.0	9.821	47.86	16 17.94	70.01	7.00	14 43 52.24		

Note. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

304 SOLAR EPHEMERIS, 1861.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semi-d. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
Nov. 1	h m s	s	° ' "	' "	"	"	m s	' "	m s	h m s
2	14 27 34.29	31.63	14 35 64.0	51.0	9.821	47.96	16 17.94	16 10.01	7.00	14 43 52.94
3	14 31 30.37	27.70	14 54 65.6	52.7	9.854	47.96	16 18.42	10.26	7.11	14 47 48.80
4	14 35 27.27	24.59	15 13 52.6	39.9	9.888	46.64	16 18.08	10.50	7.23	14 51 45.35
5	14 39 24.99	22.30	15 32 24.5	12.0	9.922	46.00	16 16.93	10.74	7.36	14 55 41.91
6	14 43 23.52	20.82	15 50 41.0	28.7	9.956	45.35	16 14.98	10.98	7.48	14 59 38.46
7	14 47 22.87	20.17	16 8 41.6	29.5	9.990	44.68	16 12.18	11.22	7.60	15 3 35.03
8	14 51 23.04	20.34	16 26 25.9	14.0	10.024	44.00	16 8.51	11.46	7.72	15 7 31.57
9	14 55 24.04	21.34	16 43 53.6	41.9	10.058	43.30	16 4.04	11.70	7.84	15 11 28.13
10	14 59 25.87	23.17	17 0 64.2	52.7	10.092	42.57	15 58.75	11.94	7.96	15 15 24.68
11	15 3 28.52	25.83	17 17 57.2	46.0	10.127	41.83	15 52.65	12.17	8.08	15 19 21.24
12	15 7 32.00	29.32	17 34 32.2	21.3	10.162	41.08	15 45.72	12.40	8.20	15 23 17.80
13	15 11 36.32	33.65	17 50 49.0	38.4	10.196	40.32	15 37.96	12.62	8.32	15 27 14.35
14	15 15 41.46	38.81	18 6 47.2	36.9	10.231	39.50	15 29.36	12.84	8.44	15 31 10.91
15	15 19 47.44	44.81	18 22 26.3	16.3	10.266	38.72	15 19.92	13.05	8.56	15 35 7.46
16	15 23 54.25	51.64	18 37 46.0	36.3	10.300	37.90	15 9.66	13.26	8.68	15 39 4.02
17	15 27 61.89	58.31	18 52 45.9	36.6	10.335	37.07	14 58.57	13.47	8.69	15 43 0.58
18	15 32 10.36	7.81	19 7 25.6	16.6	10.370	36.23	14 46.65	13.67	8.91	15 46 57.13
19	15 36 19.67	17.15	19 21 44.8	36.1	10.404	35.36	14 33.90	13.87	9.03	15 50 53.69
20	15 40 29.81	27.32	19 35 43.1	34.7	10.438	34.49	14 20.30	14.07	9.14	15 54 50.24
21	15 44 40.77	38.31	19 49 20.2	12.2	10.473	33.60	14 5.88	14.26	9.24	15 58 46.80
22	15 48 52.54	50.12	20 2 35.6	28.0	10.507	32.68	13 50.66	14.45	9.35	16 2 43.36
23	15 53 5.13	2.75	20 15 28.9	21.7	10.541	31.76	13 34.63	14.63	9.46	16 6 39.91
24	15 57 18.59	16.18	20 27 59.9	53.1	10.574	30.82	13 17.81	14.80	9.57	16 10 36.47
25	16 1 32.71	30.41	20 40 8.3	1.9	10.607	29.87	13 0.18	14.97	9.68	16 14 33.03
26	16 5 47.68	45.42	20 51 53.6	47.5	10.640	28.91	12 41.74	15.14	9.78	16 18 29.59
27	16 10 3.41	1.20	21 3 15.5	9.7	10.671	27.92	12 22.56	15.30	9.88	16 22 26.14
28	16 14 19.89	17.73	21 14 13.6	8.2	10.701	26.92	12 12.65	15.46	9.98	16 26 22.70
29	16 18 37.10	35.00	21 24 47.7	42.7	10.731	25.91	11 42.00	15.62	10.08	16 30 19.26
30	16 22 55.02	52.98	21 34 57.4	52.7	10.761	24.88	11 20.64	15.77	10.17	16 34 15.81
Dec. 1	16 27 13.62	11.64	21 44 42.4	38.0	10.789	23.85	10 58.60	15.92	10.28	16 38 12.37
2	16 31 32.88	30.96	21 53 62.4	58.3	10.816	22.81	10 35.89	16.07	10.35	16 42 8.93
3	16 35 52.78	50.93	22 2 57.1	53.4	10.842	21.75	10 12.55	16.21	10.43	16 46 5.49
4	16 40 13.29	10.51	22 11 26.3	22.9	10.866	20.68	9 48.60	16.35	10.51	16 50 2.04
5	16 44 34.38	32.67	22 19 29.6	26.5	10.890	19.60	9 24.07	16.49	10.59	16 53 58.60
6	16 48 56.02	54.38	22 27 6.9	4.1	10.912	18.51	8 59.00	16.63	10.66	16 57 55.16
7	16 53 18.17	16.61	22 34 17.8	15.3	10.933	17.41	8 33.41	16.76	10.75	17 1 51.72
8	16 57 40.81	39.33	22 41 2.3	0.1	10.953	16.30	8 7.33	16.89	10.80	17 5 48.28
9	17 2 3.92	2.52	22 47 20.0	18.1	10.972	15.18	7 40.77	17.02	10.86	17 9 44.83
10	17 6 27.46	26.14	22 53 10.7	9.0	10.989	14.05	7 13.80	17.14	10.92	17 13 41.39
11	17 10 51.41	50.17	22 58 34.4	32.9	11.005	12.92	6 46.43	17.25	10.98	17 17 37.95
12	17 15 15.74	14.58	23 3 30.8	29.5	11.021	11.78	6 18.68	17.36	11.03	17 21 34.51
13	17 19 40.40	39.32	23 7 59.8	58.7	11.035	10.64	5 50.58	17.46	11.08	17 25 31.07
14	17 24 5.38	4.39	23 12 1.2	0.3	11.047	9.49	5 22.16	17.56	11.12	17 29 27.62
15	17 28 30.64	29.74	23 15 34.9	34.2	11.058	8.33	4 53.46	17.66	11.16	17 33 24.18
16	17 32 56.16	55.35	23 18 40.8	40.3	11.069	7.17	4 24.50	17.75	11.20	17 37 20.74
17	17 37 21.91	21.19	23 21 18.7	18.3	11.077	6.00	3 55.33	17.82	11.22	17 41 17.30
18	17 41 47.86	47.23	23 23 28.6	28.3	11.084	4.83	3 25.95	17.89	11.24	17 45 13.86
19	17 46 13.99	13.45	23 25 10.4	10.2	11.091	3.65	3 56.39	17.96	11.26	17 49 10.41
20	17 50 40.25	39.80	23 26 24.1	24.0	11.096	2.47	3 26.69	18.03	11.28	17 53 6.97
21	17 55 6.63	6.27	23 27 9.5	9.5	11.101	1.29	3 56.87	18.09	11.29	17 57 3.53
22	17 59 33.08	32.81	23 27 26.5	26.5	11.103	0.11	3 26.99	18.14	11.30	18 1 0.09
23	18 3 59.59	59.42	23 27 15.2	15.2	11.105	1.06	3 57.05	18.18	11.30	18 4 56.65
24	18 8 26.12	26.04	23 26 35.6	35.6	11.105	2.24	3 27.09	18.22	11.30	18 8 53.21
25	18 12 52.63	52.64	23 25 27.8	27.8	11.103	3.42	3 2.86	18.26	11.29	18 12 49.76
26	18 17 19.09	19.19	23 23 51.6	51.6	11.100	4.60	0 32.77	18.28	11.28	18 16 46.32
27	18 21 45.47	45.66	23 21 47.2	47.1	11.096	5.77	1 2.60	18.30	11.27	18 20 42.88
28	18 26 11.73	12.01	23 19 14.6	14.4	11.091	6.95	1 32.31	18.32	11.25	18 24 39.44
29	18 30 37.82	38.19	23 16 13.8	13.5	11.083	8.12	2 1.86	18.33	11.22	18 28 36.00
30	18 35 3.72	4.18	23 12 45.0	44.6	11.075	9.28	2 31.22	18.34	11.19	18 32 32.55
31	18 39 29.39	29.94	23 8 48.2	47.7	11.065	10.44	3 0.34	18.35	11.15	18 36 29.11
32	18 43 54.79	55.43	23 4 23.5	22.9	11.053	11.60	3 29.18	18.36	11.11	18 40 25.67
33	18 48 19.89	20.62	22 59 31.1	30.4	11.040	12.75	3 57.72	18.36	11.07	18 44 22.23

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

MOON CULMINATIONS, 1861. 305

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Lib and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Jan. 1	^d 0	II. L.	^{h m s} 10 50 43.25	2.12077	67.15	+ 8 6 49.0	-2.97988
1	1	II. v.	11 17 5.76	2.11966	67.06	0 5 3.9	-2.98276
2	1	II. L.	11 43 28.17	2.12103	67.21	3 16 49.1	-2.97966
2	2	II. v.	12 10 0.24	2.12493	67.53	- 6 25 53.3	-2.97046
3	3	II. L.	12 36 50.90	2.13117	68.04	- 9 29 39.0	-2.95477
3	3	II. v.	13 4 8.54	2.13931	68.71	-12 25 26.8	-2.93170
4	4	II. L.	13 32 0.35	2.14897	69.47	-15 10 35.5	-2.90016
4	4	II. v.	14 0 31.93	2.15951	70.33	-17 42 22.6	-2.85796
5	5	II. L.	14 29 46.50	2.17026	71.23	-19 58 5.9	-2.80216
5	5	II. v.	14 59 44.23	2.18053	72.07	-21 55 8.5	-2.72789
6	6	II. L.	15 30 21.71	2.18921	72.80	-23 31 6.1	-2.62682
6	6	II. v.	16 1 31.62	2.19587	73.32	-24 43 54.4	-2.48186
7	7	II. L.	16 33 3.01	2.19901	73.59	-25 32 0.3	-2.24773
7	7	II. v.	17 4 41.82	2.19904	73.56	-25 54 30.4	-1.68115
8	8	II. L.	17 36 12.54	2.19532	73.21	-25 51 16.5	+1.90135
8	8	II. v.	18 7 19.66	2.18814	72.56	-25 22 57.7	+2.30546
9	9	II. L.	18 37 49.18	2.17774	71.65	-24 30 56.0	+2.49995
9	9	II. v.	19 7 30.16	2.16483	70.55	-23 17 8.7	+2.62273
10	10	I. L.	19 33 56.53	2.15017	69.31	-21 43 56.9	+2.70757
11	10	I. v.	20 1 44.37	2.13437	68.03	-19 53 57.6	+2.76900
11	11	I. L.	20 28 32.10	2.11836	66.76	-17 49 48.0	+2.81412
12	11	I. v.	20 54 22.09	2.10275	65.57	-15 34 2.2	+2.84730
12	12	I. L.	21 19 18.82	2.08810	64.44	-13 9 6.6	+2.87142
13	12	I. v.	21 43 28.20	2.07496	63.48	-10 37 12.7	+2.88841
13	13	I. L.	22 6 57.16	2.06382	62.67	- 8 0 21.0	+2.89961
14	13	I. v.	22 29 53.27	2.05473	62.04	- 5 20 17.7	+2.90605
14	14	I. L.	22 52 24.28	2.04813	61.58	- 2 38 37.9	+2.90840
15	14	I. v.	23 14 38.45	2.04403	61.31	+ 0 3 12.8	+2.90713
15	15	I. L.	23 36 43.52	2.04246	61.23	+ 2 43 56.8	+2.90244
16	15	I. v.	23 58 47.55	2.04356	61.33	+ 5 22 21.6	+2.89445
16	16	I. L.	0 20 58.48	2.04719	61.61	+ 7 57 16.6	+2.88307
17	17	I. v.	0 43 24.02	2.05323	62.08	+10 27 31.7	+2.86787
17	17	I. L.	1 6 11.84	2.06156	62.70	+12 51 54.6	+2.84827
18	18	I. v.	1 29 29.29	2.07195	63.48	+15 9 8.1	+2.81685
18	18	I. L.	1 53 23.18	2.08400	64.39	+17 17 48.9	+2.79208
19	19	I. v.	2 17 59.74	2.09743	65.41	+19 16 25.2	+2.75208
19	19	I. L.	2 43 23.98	2.11167	66.51	+21 3 15.4	+2.70060
20	20	I. v.	3 9 39.69	2.12620	67.65	+22 36 31.4	+2.63264
20	20	I. L.	3 36 48.63	2.14029	68.77	+23 54 16.6	+2.54002
21	21	I. v.	4 4 50.04	2.15351	69.83	+24 54 31.0	+2.40498
21	21	I. L.	4 33 40.48	2.16504	70.77	+25 35 17.3	+2.18127
22	22	I. v.	5 3 13.50	2.17421	71.54	+25 54 47.3	+1.62014
22	22	I. L.	5 33 19.88	2.18090	72.07	+25 51 31.4	-1.87622
22	23	I. v.	6 3 48.21	2.18455	72.36	+25 24 26.8	-2.29237
23	23	I. L.	6 34 26.03	2.18520	72.38	+24 33 4.9	-2.50169
24	24	I. v.	7 5 0.95	2.18301	72.16	+23 17 37.0	-2.64013
24	24	I. L.	7 35 21.90	2.17846	71.75	+21 38 54.3	-2.73991
25	25	I. v.	8 5 20.12	2.17208	71.19	+19 38 26.5	-2.81524
26	25	II. L.	8 37 10.94	2.16462	70.55	+17 18 17.0	-2.87276
26	26	II. v.	9 6 8.23	2.15676	69.90	+14 40 56.2	-2.91651

306 MOON CULMINATIONS, 1861.

WASHINGTON MERIDIAN.								
Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi- diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.	
Jan.	27	26	II. L.	9 34 34.81	2.14931	69.28	+11 49 13.3	-2.94921
	27	27	II. v.	10 2 33.79	2.14270	68.76	+ 8 46 9.4	-2.97242
	28	27	II. L.	10 30 10.29	2.13761	68.36	+ 5 34 54.3	-2.98739
	28	28	II. v.	10 57 30.86	2.13440	68.13	+ 2 18 38.8	-2.99493
	29	28	II. L.	11 24 43.11	2.13328	68.06	- 0 59 26.2	-2.99554
	29	29	II. v.	11 51 55.15	2.13431	68.18	- 4 16 14.0	-2.99932
	30	30	II. L.	12 19 15.25	2.13748	68.46	- 7 28 42.2	-2.97613
	30	30	II. v.	12 46 51.24	2.14261	68.91	-10 33 52.8	-2.95555
	31	31	II. L.	13 14 50.09	2.14900	69.49	-13 28 54.5	-2.92688
	31	31	II. v.	13 43 17.63	2.15718	70.16	-16 11 1.1	-2.88963
	31	31	II. L.	14 12 17.66	2.16563	70.88	-18 37 35.1	-2.83868
Feb.	1	32	II. v.	14 41 51.72	2.17386	71.60	-20 46 9.0	-2.77388
	2	33	II. L.	15 11 58.28	2.18127	72.22	-22 34 29.9	-2.69838
	2	33	II. v.	15 42 32.81	2.18704	72.72	-24 0 43.2	-2.57198
	3	34	II. L.	16 13 27.48	2.19064	73.03	-25 3 21.6	-2.40831
	3	34	II. v.	16 44 31.74	2.19151	73.08	-25 41 28.5	-2.10877
	4	35	II. L.	17 15 33.25	2.18932	72.86	-25 54 44.0	-0.64345
	4	35	II. v.	17 46 18.95	2.18409	72.38	-25 43 26.6	+2.06635
	5	36	II. L.	18 16 36.35	2.17603	71.64	-25 8 30.3	+2.36455
	5	36	II. v.	18 46 14.92	2.16545	70.71	-24 11 22.6	+2.52892
	6	37	II. L.	19 15 6.56	2.15290	69.63	-22 53 55.9	+2.63797
	6	37	II. v.	19 43 6.33	2.13906	68.46	-21 18 19.6	+2.71560
	7	38	II. L.	20 10 12.05	2.12457	67.26	-19 26 52.8	+2.77299
	7	38	II. v.	20 36 24.28	2.11015	66.09	-17 21 56.7	+2.81591
	8	39	II. L.	21 1 45.69	2.09621	64.99	-15 5 49.4	+2.84811
	9	39	II. v.	21 26 20.63	2.08325	63.99	-12 40 44.9	+2.87173
	9	40	I. L.	21 48 8.37	2.07173	63.12	-10 8 46.9	+2.88860
	10	40	I. v.	22 11 29.04	2.06202	62.39	- 7 31 49.9	+2.89984
	10	41	I. L.	22 34 21.40	2.05419	61.84	- 4 51 40.1	+2.90633
	11	41	I. v.	22 56 52.47	2.04860	61.45	- 2 9 55.2	+2.90854
	11	42	I. L.	23 19 9.34	2.04532	61.23	+ 0 31 55.4	+2.90692
	12	42	I. v.	23 41 19.17	2.04427	61.18	+ 3 12 28.0	+2.90158
	12	43	I. L.	0 3 29.05	2.04555	61.30	+ 5 50 22.7	+2.89856
	13	44	I. v.	0 25 46.01	2.04906	61.59	+ 8 24 23.3	+2.87985
	13	44	I. L.	0 48 16.93	2.05469	62.04	+10 53 15.1	+2.86302
	14	45	I. v.	1 11 8.50	2.06236	62.63	+13 15 40.9	+2.84136
	14	45	I. L.	1 34 27.08	2.07181	63.36	+15 30 22.7	+2.81421
	15	46	I. v.	1 58 18.57	2.08272	64.22	+17 35 59.0	+2.78025
	15	46	I. L.	2 22 48.23	2.09465	65.17	+19 31 2.3	+2.73747
	16	47	I. v.	2 48 0.39	2.10738	66.17	+21 13 59.7	+2.68294
	16	47	I. L.	3 13 58.03	2.12034	67.21	+22 43 14.2	+2.61173
	17	48	I. v.	3 40 42.64	2.13300	68.24	+23 57 3.4	+2.51558
	17	48	I. L.	4 8 13.69	2.14495	69.22	+24 53 44.5	+2.37621
	18	49	I. v.	4 36 28.40	2.15552	70.08	+25 31 36.6	+2.14470
	18	49	I. L.	5 5 21.68	2.16423	70.81	+25 49 6.1	+1.53453
	19	50	I. v.	5 34 46.39	2.17085	71.34	+25 44 53.4	-1.88722
	19	50	I. L.	6 4 33.58	2.17476	71.67	+25 17 59.2	-2.28416
	20	51	I. v.	6 34 33.60	2.17682	71.80	+24 27 49.9	-2.49020
	20	51	I. L.	7 4 36.54	2.17632	71.72	+23 14 22.0	-2.62836
	21	52	I. v.	7 34 32.47	2.17383	71.47	+21 38 5.9	-2.72979

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Feb.	^d		^{h m s}		^s	[°]	
21	52	I. L.	8 4 17.19	2.16988	71.10	+19 40 4.8	-2.80763
22	53	I. v.	8 33 42.81	2.16501	70.65	+17 21 53.8	-2.86809
23	53	I. L.	9 2 47.92	2.15984	70.18	+14 45 37.9	-2.91516
23	54	I. v.	9 31 32.60	2.15491	69.75	+11 53 46.6	-2.95113
23	54	I. L.	9 59 59.32	2.15085	69.39	+ 8 49 11.4	-2.97749
24	55	II. v.	10 30 30.63	2.14808	69.16	+ 5 35 0.5	-2.99533
25	55	II. L.	10 58 35.46	2.14700	69.06	+ 2 14 34.7	-3.00512
25	56	II. v.	11 26 39.34	2.14765	69.12	- 1 8 35.8	-3.00724
26	56	II. L.	11 54 49.46	2.15017	69.35	- 4 30 56.7	-3.00156
26	57	II. v.	12 23 13.09	2.15448	69.74	- 7 48 52.0	-2.98791
27	58	II. L.	12 51 56.75	2.16033	70.25	-10 58 48.8	-2.96570
27	58	II. v.	13 21 5.96	2.16717	70.85	-13 57 23.0	-2.93386
28	59	II. L.	13 50 44.48	2.17461	71.53	-16 41 18.3	-2.89095
28	59	II. v.	14 20 53.77	2.18184	72.18	-19 7 36.2	-2.83431
Mar. 1	60	II. L.	14 51 32.55	2.18851	72.78	-21 13 38.9	-2.76006
1	60	II. v.	15 22 36.32	2.19357	73.26	-22 57 15.4	-2.66182
2	61	II. L.	15 53 57.48	2.19651	73.54	-24 16 46.7	-2.52559
2	61	II. v.	16 25 25.86	2.19681	73.59	-25 11 11.0	-2.31850
3	62	II. L.	16 56 49.41	2.19427	73.37	-25 40 5.7	-1.90907
3	62	II. v.	17 27 55.32	2.18868	72.88	-25 43 49.5	+1.63347
4	63	II. L.	17 58 31.49	2.18080	72.15	-25 23 17.9	+2.90699
4	63	II. v.	18 28 27.51	2.16963	71.22	-24 39 57.4	+2.43281
5	64	II. L.	18 57 35.59	2.15688	70.11	-23 35 38.1	+2.56884
5	64	II. v.	19 25 50.80	2.14298	68.93	-22 19 26.3	+2.66225
6	65	II. L.	19 53 11.09	2.12843	67.72	-20 32 35.2	+2.73012
6	65	II. v.	20 19 37.02	2.11384	66.52	-18 38 19.2	+2.78110
7	66	II. L.	20 45 11.25	2.09973	65.38	-16 31 50.1	+2.81912
7	66	II. v.	21 9 57.99	2.08658	64.32	-14 15 14.1	+2.84812
8	67	II. L.	21 34 2.67	2.07486	63.39	-11 50 29.4	+2.86978
8	67	II. v.	21 57 31.36	2.06476	62.61	- 9 19 26.3	+2.88540
9	68	II. L.	22 20 30.59	2.05652	61.97	- 6 43 48.3	+2.88540
9	68	II. v.	22 43 7.10	2.05034	61.48	- 4 5 12.6	+2.90187
10	69	II. L.	23 5 27.72	2.04630	61.19	- 1 25 10.3	+2.90381
11	69	I. v.	23 25 37.09	2.04442	61.05	+ 1 14 51.8	+2.90183
11	70	I. L.	23 47 46.05	2.04470	61.07	+ 3 53 29.7	+2.89623
12	71	I. v.	0 9 58.75	2.04704	61.25	+ 6 29 22.0	+2.88662
12	71	I. L.	0 32 21.55	2.05135	61.57	+ 9 1 8.2	+2.87303
13	72	I. v.	0 55 0.52	2.05759	62.04	+11 27 27.4	+2.85475
13	72	I. L.	1 18 1.39	2.06543	62.65	+13 46 57.8	+2.83137
14	73	I. v.	1 41 29.48	2.07456	63.37	+15 58 15.8	+2.80186
14	73	I. L.	2 5 29.49	2.08486	64.18	+17 59 56.2	+2.76478
15	74	I. v.	2 30 5.28	2.09587	65.06	+19 50 30.2	+2.71798
15	74	I. L.	2 55 19.67	2.10728	65.97	+21 28 26.9	+2.65844
16	75	I. v.	3 21 14.22	2.11857	66.90	+22 52 14.9	+2.58083
16	75	I. L.	3 47 48.97	2.12927	67.80	+24 0 22.1	+2.47560
17	76	I. v.	4 15 2.19	2.13909	68.63	+24 51 20.3	+2.32166
17	76	I. L.	4 42 50.35	2.14749	69.35	+25 23 47.2	+2.05625
18	77	I. v.	5 11 8.32	2.15427	69.93	+25 36 30.0	+1.09482
18	77	I. L.	5 39 49.49	2.15912	70.32	+25 28 30.5	-1.96778
19	78	I. v.	6 8 46.33	2.16197	70.58	+24 59 7.8	-2.30307

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Mar. 19	78 ^d	I. L.	6 37 51.26	2.16292	70.65	+24 8 2.4	-2.49107
20	79	I. U.	7 6 56.76	2.16294	70.57	+22 55 17.6	-2.62042
20	79	I. L.	7 35 56.67	2.16014	70.38	+21 21 20.1	-2.71720
21	80	I. U.	8 4 46.51	2.15719	70.10	+19 27 1.5	-2.79273
21	80	I. L.	8 33 23.63	2.15375	69.78	+17 13 35.4	-2.85275
22	81	I. U.	9 1 47.49	2.15051	69.48	+14 42 38.4	-2.90057
22	81	I. L.	9 29 59.58	2.14793	69.23	+11 56 9.1	-2.93823
23	82	I. U.	9 58 3.28	2.14635	69.06	+8 56 27.9	-2.96714
23	82	I. L.	10 26 3.47	2.14625	69.01	+5 46 13.1	-2.98805
24	83	I. U.	10 54 6.30	2.14788	69.11	+2 28 22.6	-3.00121
24	83	I. L.	11 22 18.58	2.15131	69.37	-0 53 45.6	-3.00653
25	84	I. U.	11 50 47.67	2.15652	69.80	-4 16 37.3	-3.00427
26	85	II. L.	12 22 1.47	2.16334	70.38	-7 36 27.4	-2.99301
26	85	II. U.	12 51 26.34	2.17161	71.07	-10 49 22.3	-2.97344
27	86	II. L.	13 21 26.81	2.18079	71.85	-13 51 25.0	-2.94275
27	86	II. U.	13 52 5.72	2.18996	72.67	-16 38 44.1	-2.89963
28	87	II. L.	14 23 22.80	2.19852	73.45	-19 7 43.1	-2.84109
28	87	II. U.	14 55 14.34	2.20562	74.11	-21 15 9.7	-2.76852
29	88	II. L.	15 27 32.71	2.21048	74.58	-22 58 26.3	-2.65556
29	88	II. U.	16 0 6.73	2.21248	74.81	-24 15 40.3	-2.50352
30	89	II. L.	16 32 42.31	2.21115	74.73	-25 5 50.3	-2.26152
30	89	II. U.	17 5 4.01	2.20626	74.33	-25 28 50.2	-1.68006
31	90	II. L.	17 36 56.60	2.19805	73.64	-25 25 23.3	+1.90924
31	90	II. U.	18 8 6.61	2.18689	72.67	-24 56 57.6	+2.30395
Apr. 1	91	II. L.	18 38 23.66	2.17298	71.50	-24 5 34.5	+2.49191
1	91	II. U.	19 7 41.01	2.15788	70.21	-22 53 34.7	+2.61003
2	92	II. L.	19 35 55.51	2.14170	68.86	-21 23 20.0	+2.69114
2	92	II. U.	20 3 7.30	2.12526	67.52	-19 37 48.9	+2.75073
3	93	II. L.	20 29 19.16	2.10931	66.23	-17 38 58.3	+2.79453
3	93	II. U.	20 54 35.85	2.09433	65.03	-15 29 11.9	+2.82778
4	94	II. L.	21 19 3.42	2.08061	63.97	-13 10 33.5	+2.85856
4	94	II. U.	21 42 48.22	2.06904	63.04	-10 44 55.0	+2.87090
5	95	II. L.	22 5 59.37	2.05929	62.28	-8 13 58.5	+2.88383
5	95	II. U.	22 28 42.42	2.05181	61.68	-5 39 17.4	+2.89227
6	96	II. L.	22 51 5.73	2.04687	61.26	-3 2 18.5	+2.89672
6	96	II. U.	23 13 16.39	2.04364	61.01	-0 24 24.0	+2.89738
7	97	II. L.	23 35 21.59	2.04297	60.94	+2 13 5.9	+2.89447
7	97	II. U.	23 57 28.19	2.04454	61.02	+4 48 52.9	+2.88791
8	98	II. L.	0 19 42.81	2.04817	61.27	+7 21 39.5	+2.87749
8	99	II. U.	0 42 11.67	2.05369	61.66	+9 50 4.9	+2.86868
9	99	II. L.	1 5 0.59	2.06097	62.18	+12 12 47.8	+2.84316
10	100	I. U.	1 26 9.37	2.06963	62.82	+14 28 24.0	+2.81804
10	100	I. L.	1 49 52.32	2.07940	63.56	+16 35 24.2	+2.78605
11	101	I. U.	2 14 8.94	2.09002	64.37	+18 32 17.4	+2.74555
11	101	I. L.	2 39 2.00	2.10089	65.23	+20 17 32.1	+2.69402
12	102	I. U.	3 4 32.93	2.11167	66.10	+21 49 33.0	+2.62778
12	102	I. L.	3 30 41.66	2.12189	66.94	+23 6 48.9	+2.54028
13	103	I. U.	3 57 26.46	2.13124	67.73	+24 7 52.1	+2.41891
13	103	I. L.	4 24 43.81	2.13919	68.41	+24 51 21.2	+2.23416
14	104	I. U.	4 52 28.59	2.14548	68.97	+25 16 7.3	+1.87703

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Apr. 14	104	I. L.	5 20 34.37	2.14966	69.37	+25 21 15.7	-1.39058
15	105	I. U.	5 48 53.80	2.15229	69.61	+25 6 9.0	-2.10360
15	105	I. L.	6 17 19.35	2.15284	69.67	+24 30 29.1	-2.36129
16	106	I. U.	6 45 43.87	2.15168	69.59	+23 34 19.2	-2.52072
16	106	I. L.	7 14 1.23	2.14913	69.41	+22 18 1.9	-2.63413
17	107	I. U.	7 42 6.95	2.14576	69.14	+20 42 19.2	-2.72058
17	107	I. L.	8 9 58.35	2.14186	68.83	+18 48 9.7	-2.78880
18	108	I. U.	8 37 34.83	2.13796	68.51	+16 36 47.8	-2.84353
18	108	I. L.	9 4 57.86	2.13484	68.22	+14 9 41.6	-2.88765
19	109	I. U.	9 32 10.62	2.13274	68.02	+11 28 32.4	-2.92308
19	109	I. U.	9 59 18.01	2.13213	67.94	+ 8 35 15.8	-2.95092
20	110	I. L.	10 26 26.28	2.13344	68.01	+ 5 32 2.5	-2.97169
20	110	I. U.	10 53 42.73	2.13669	68.24	+ 2 21 19.5	-2.98569
21	111	I. L.	11 21 15.24	2.14211	68.65	- 0 54 8.7	-2.99309
21	111	I. U.	11 49 12.27	2.14961	69.22	- 4 11 18.4	-2.99322
22	112	I. U.	12 17 41.91	2.15891	69.97	- 7 26 45.9	-2.98538
22	113	I. L.	12 46 51.72	2.16976	70.86	-10 36 48.9	-2.96855
23	113	I. U.	13 16 47.81	2.18153	71.84	-13 37 32.4	-2.94134
23	114	I. L.	13 47 33.85	2.19348	72.87	-16 24 55.1	-2.90128
24	114	II. U.	14 21 38.06	2.20477	73.86	-18 54 56.3	-2.84525
25	115	II. L.	14 54 3.10	2.21426	74.73	-21 3 51.5	-2.76797
25	115	II. U.	15 27 6.04	2.22133	75.38	-22 48 26.9	-2.66051
26	116	II. L.	16 0 33.52	2.22490	75.74	-24 6 15.0	-2.50398
26	116	II. U.	16 34 8.60	2.22458	75.73	-24 55 46.9	-2.24529
27	117	II. L.	17 7 32.17	2.21936	75.36	-25 16 40.3	-1.52647
27	117	II. U.	17 40 25.20	2.21131	74.62	-25 9 37.0	+2.01153
28	118	II. L.	18 12 31.14	2.19904	73.58	-24 36 16.3	+2.35911
28	118	II. U.	18 43 37.28	2.18404	72.31	-23 38 59.4	+2.53357
29	119	II. L.	19 13 35.52	2.16705	70.87	-22 20 33.0	+2.64359
29	119	II. U.	19 42 22.51	2.14903	69.40	-20 43 54.6	+2.71908
30	120	II. L.	20 9 58.74	2.13085	67.92	-18 51 57.7	+2.77329
30	120	II. U.	20 36 27.94	2.11330	66.52	-16 47 26.1	+2.81276
May 1	121	II. L.	21 1 56.06	2.09691	65.24	-14 32 48.8	+2.84171
1	121	II. U.	21 26 30.38	2.08218	64.10	-12 10 17.9	+2.86271
2	122	II. L.	21 50 19.04	2.06956	63.14	- 9 41 49.8	+2.87756
2	122	II. U.	22 13 30.39	2.05926	62.35	- 7 9 6.5	+2.88739
3	123	II. L.	22 36 12.88	2.05150	61.73	- 4 33 39.4	+2.89305
3	123	II. U.	22 58 35.05	2.04630	61.33	- 1 56 50.3	+2.89509
4	124	II. L.	23 20 45.17	2.04356	61.11	+ 0 40 4.5	+2.89363
4	124	II. U.	23 42 50.78	2.04328	61.05	+ 3 15 51.9	+2.88880
5	125	II. L.	0 4 59.21	2.04544	61.17	+ 5 49 20.1	+2.88056
5	126	II. U.	0 27 17.75	2.04984	61.45	+ 8 19 16.2	+2.86849
6	126	II. L.	0 49 53.27	2.05625	61.59	+10 44 24.5	+2.85222
6	127	II. U.	1 12 51.73	2.06438	62.46	+13 3 25.9	+2.83094
7	127	II. L.	1 36 18.66	2.07394	63.14	+15 14 56.6	+2.80366
7	128	II. U.	2 0 18.73	2.08458	63.92	+17 17 27.3	+2.76896
8	128	II. L.	2 24 55.50	2.09577	64.75	+19 9 24.5	+2.72487
8	129	II. U.	2 50 11.25	2.10707	65.62	+20 49 12.2	+2.66828
9	129	I. L.	3 13 53.56	2.11803	66.49	+22 15 12.7	+2.59426
10	130	I. U.	3 40 25.58	2.12814	67.30	+23 25 50.0	+2.49425

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May	10	130	I. L.	4 7 32.85	2.13694	68.02	+24 19 35.2	+2.35000
	11	131	I. U.	4 35 10.48	2.14392	68.62	+24 55 9.4	+2.11568
	11	131	I. L.	5 3 11.51	2.14876	69.06	+25 11 28.6	+1.50705
	12	132	I. U.	5 31 27.98	2.15165	69.32	+25 7 48.7	-1.83948
	12	132	I. L.	5 59 51.28	2.15220	69.40	+24 43 47.5	-2.23325
	13	133	I. U.	6 28 12.92	2.15079	69.32	+23 59 25.7	-2.43478
	13	133	I. L.	6 56 25.39	2.14746	69.08	+22 55 6.9	-2.56863
	14	134	I. U.	7 24 22.31	2.14266	68.74	+21 31 36.5	-2.66650
	14	134	I. L.	7 52 0.48	2.13748	68.33	+19 49 54.7	-2.74183
	15	135	I. U.	8 19 18.01	2.13188	67.90	+17 51 17.4	-2.80160
	15	135	I. L.	8 46 14.79	2.12662	67.49	+15 37 15.6	-2.84888
	16	136	I. U.	9 12 53.39	2.12228	67.15	+13 9 24.6	-2.88703
	16	136	I. L.	9 39 18.18	2.11926	66.91	+10 29 28.0	-2.91740
	17	137	I. U.	10 5 35.01	2.11813	66.82	+ 7 39 17.6	-2.94109
	17	137	I. L.	10 31 50.97	2.11906	66.88	+ 4 40 54.1	-2.95866
	18	138	I. U.	10 58 14.09	2.12232	67.11	+ 1 36 26.4	-2.97090
	18	138	I. L.	11 24 53.28	2.12792	67.55	+13 9 45.2	-2.97587
	19	139	I. U.	11 51 57.62	2.13599	68.17	+ 4 41 3.8	-2.97585
	19	140	I. L.	12 19 36.16	2.14622	68.97	+ 7 48 35.6	-2.96759
	20	140	I. U.	12 47 57.57	2.15827	69.93	+10 51 10.4	-2.95171
20	141	I. L.	13 17 9.22	2.17149	71.02	+13 45 21.8	-2.99673	
21	141	I. U.	13 47 16.49	2.18523	72.16	+16 27 26.0	-2.89857	
21	142	I. L.	14 18 21.60	2.19866	73.30	+18 53 34.0	-2.83498	
22	142	I. U.	14 50 22.77	2.21067	74.25	+21 0 1.8	-2.76127	
22	143	I. L.	15 23 13.14	2.22029	75.20	+22 43 21.6	-2.65690	
23	143	I. U.	15 56 40.63	2.22650	75.77	+24 0 42.3	-2.50843	
24	144	II. L.	16 33 0.19	2.22863	75.97	+24 50 3.9	-2.24202	
24	144	II. U.	17 6 47.63	2.22616	75.78	+25 10 34.1	-1.83344	
25	145	II. L.	17 40 13.31	2.21924	75.18	+25 2 28.4	+2.04202	
25	145	II. U.	18 12 57.83	2.20825	74.22	+24 27 9.1	+2.32940	
26	146	II. L.	18 44 45.63	2.19393	72.99	+23 26 52.2	+2.55540	
26	146	II. U.	19 15 25.95	2.17716	71.57	+22 4 29.0	+2.66463	
27	147	II. L.	19 44 53.28	2.15894	70.07	+20 23 9.0	+2.73225	
27	147	II. U.	20 13 6.81	2.14022	68.56	+18 26 4.0	+2.79220	
28	148	II. L.	20 40 9.39	2.12186	67.12	+16 16 15.5	+2.82299	
28	148	II. U.	21 6 6.81	2.10469	65.78	+13 56 30.2	+2.85696	
29	149	II. L.	21 31 6.32	2.08913	64.59	+11 29 15.2	+2.87583	
29	149	II. U.	21 55 16.32	2.07559	63.58	+ 8 56 39.1	+2.88633	
30	150	II. L.	22 18 45.68	2.06446	62.74	+ 6 20 32.6	+2.89571	
30	150	II. U.	22 41 43.45	2.05591	62.11	+ 3 42 32.2	+2.89997	
31	151	II. L.	23 4 18.45	2.05003	61.67	+ 1 4 3.2	+2.89642	
31	151	II. U.	23 26 39.27	2.04699	61.42	+ 1 33 36.6	+2.89459	
June	1	152	II. L.	23 48 54.43	2.04630	61.36	+ 4 9 21.8	+2.88741
	1	153	II. U.	0 11 11.85	2.04822	61.48	+ 6 41 58.0	+2.87696
	2	153	II. L.	0 33 39.11	2.05261	61.75	+ 9 10 18.3	+2.86980
	2	154	II. U.	0 56 23.45	2.05918	62.21	+11 33 12.2	+2.84438
	3	154	II. L.	1 19 31.62	2.06755	62.81	+13 49 24.6	+2.82090
	3	155	II. U.	1 43 9.42	2.07744	63.52	+15 57 35.6	+2.79131
	4	155	II. L.	2 7 21.96	2.08856	64.31	+17 56 19.1	+2.75393
	4	156	II. U.	2 32 13.18	2.10020	65.18	+19 44 2.1	+2.70629

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
June 5	156 ^d	II. L.	2 57 45.39	2.11200	66.08	+21 19 9.5	+2.64478
5	157	II. v.	3 23 59.34	2.12346	66.96	+23 40 1.7	+2.56340
6	157	II. L.	3 50 53.66	2.13389	67.78	+23 45 1.1	+2.45119
6	158	II. v.	4 18 24.57	2.14283	68.49	+24 32 35.3	+2.28323
7	158	II. L.	4 46 26.04	2.14986	69.06	+25 1 23.7	+1.98764
8	159	I. v.	5 12 31.71	2.15458	69.45	+25 10 21.9	—0.78533
8	159	I. L.	5 41 9.80	2.15688	69.65	+24 58 47.9	—2.04040
9	160	I. v.	6 9 52.45	2.15670	69.66	+24 26 24.7	—2.33023
9	160	I. L.	6 38 30.24	2.15430	69.48	+23 33 23.0	—2.49954
10	161	I. v.	7 6 54.82	2.14992	69.14	+23 20 19.0	—2.61683
10	161	I. L.	7 34 59.69	2.14414	68.70	+20 48 13.3	—2.70398
11	162	I. v.	8 2 40.62	2.13754	68.19	+18 58 25.7	—2.77140
11	162	I. L.	8 29 55.77	2.13069	67.66	+16 52 31.0	—2.82413
12	163	I. v.	8 56 45.68	2.12418	67.19	+14 32 15.8	—2.86565
12	163	I. L.	9 23 13.13	2.11860	66.75	+11 59 32.8	—2.89843
13	164	I. v.	9 49 22.57	2.11448	66.45	+ 9 16 19.9	—2.92369
13	164	I. L.	10 15 20.06	2.11217	66.29	+ 6 24 39.8	—2.94254
14	165	I. v.	10 41 12.96	2.11210	66.29	+ 3 26 37.5	—2.95543
14	165	I. L.	11 7 9.31	2.11435	66.47	+ 0 24 23.7	—2.96273
15	166	I. v.	11 33 17.98	2.11916	66.85	— 2 39 44.3	—2.96447
15	166	I. L.	11 59 48.18	2.12643	67.42	— 5 43 22.3	—2.96029
16	167	I. v.	12 26 49.01	2.13590	68.18	— 8 43 54.6	—2.94955
16	168	I. L.	12 54 29.23	2.14731	69.09	—11 38 32.6	—2.93121
17	168	I. v.	13 22 56.50	2.16014	70.13	—14 24 16.5	—2.90367
17	169	I. L.	13 52 16.74	2.17377	71.25	—16 57 53.1	—2.86463
18	169	I. v.	14 22 33.33	2.18730	72.38	—19 16 4.4	—2.81078
18	170	I. L.	14 53 45.85	2.19990	73.46	—21 15 33.4	—2.73657
19	170	I. v.	15 25 49.56	2.21037	74.36	—22 53 8.9	—2.63161
19	171	I. L.	15 58 34.56	2.21798	75.02	—24 6 2.0	—2.47550
20	171	I. v.	16 31 46.72	2.22184	75.35	—24 52 13.5	—2.20960
20	172	I. L.	17 5 7.60	2.22138	75.31	—25 10 38.6	—1.34635
21	172	I. v.	17 38 17.32	2.21666	74.86	—25 1 10.9	+2.06405
22	173	II. L.	18 13 24.91	2.20787	74.09	—24 24 44.0	+2.39229
22	173	II. v.	18 45 15.42	2.19549	73.02	—23 23 13.2	+2.56367
23	174	II. L.	19 16 6.19	2.18041	71.74	—21 59 12.6	+2.67340
23	174	II. v.	19 45 49.93	2.16361	70.33	—20 15 41.8	+2.74898
24	175	II. L.	20 14 24.02	2.14598	68.89	—18 15 51.0	+2.80261
24	175	II. v.	20 41 49.66	2.12837	67.48	—16 2 47.0	+2.84099
25	176	II. L.	21 8 11.12	2.11150	66.17	—13 39 25.3	+2.86810
25	176	II. v.	21 33 34.75	2.09611	65.00	—11 8 24.2	+2.88660
26	177	II. L.	21 58 8.24	2.08254	63.98	— 8 32 4.3	+2.89637
26	177	II. v.	22 21 59.94	2.07119	63.16	— 5 52 28.8	+2.90470
27	178	II. L.	22 45 18.44	2.06225	62.51	— 3 11 24.3	+2.90655
27	178	II. v.	23 8 12.51	2.05584	62.06	— 0 30 23.9	+2.90444
28	179	II. L.	23 30 50.75	2.05215	61.80	+ 2 9 9.9	+2.89873
28	179	II. v.	23 53 21.42	2.05100	61.72	+ 4 46 2.7	+2.88959
29	180	II. L.	0 15 52.56	2.05242	61.83	+ 7 19 3.2	+2.87701
29	181	II. v.	0 38 31.96	2.05625	62.11	+ 9 47 3.2	+2.86071
30	181	II. L.	1 1 26.95	2.06223	62.55	+12 8 54.0	+2.84003
30	182	II. v.	1 24 44.33	2.07023	63.12	+14 23 23.9	+2.81432

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July							
1	182	II. L.	1 48 30.32	2.07983	63.82	+16° 29' 17.2	+2.73282
1	183	II. U.	2 12 50.24	2.09061	64.62	+18 25 12.6	+2.74213
2	183	II. L.	2 37 48.39	2.10216	65.49	+20 9 43.3	+2.69156
2	184	II. U.	3 3 27.54	2.11397	66.38	+21 41 16.8	+2.63615
3	184	II. L.	3 29 48.83	2.12548	67.27	+22 58 17.9	+2.53909
3	185	II. U.	3 56 51.29	2.13618	68.10	+23 59 10.7	+2.41734
4	185	II. L.	4 24 31.69	2.14554	68.83	+24 42 23.5	+2.22922
4	186	II. U.	4 52 44.58	2.15299	69.42	+25 6 33.6	+1.85412
5	186	II. L.	5 21 22.45	2.15821	69.82	+25 10 35.2	-1.50065
5	187	II. U.	5 50 16.27	2.16104	70.04	+24 53 42.2	-2.13830
6	187	II. L.	6 19 16.22	2.16128	70.04	+24 15 34.0	-2.26694
6	188	II. U.	6 48 12.64	2.15927	69.86	+23 16 19.2	-2.54175
7	188	I. L.	7 14 37.83	2.15528	69.53	+21 56 37.5	-2.65127
8	189	I. U.	7 43 3.88	2.14971	69.08	+20 17 31.0	-2.73373
8	189	I. L.	8 11 6.30	2.14314	68.55	+18 20 27.8	-2.79739
9	190	I. U.	8 38 42.70	2.13695	68.00	+16 7 14.7	-2.84705
9	190	I. L.	9 5 53.16	2.12959	67.48	+13 39 51.7	-2.88579
10	191	I. U.	9 32 40.02	2.12372	67.04	+11 0 28.4	-2.91547
10	191	I. L.	9 59 7.44	2.11923	66.70	+ 8 11 21.6	-2.93757
11	192	I. U.	10 25 21.10	2.11638	66.51	+ 5 14 51.0	-2.95285
11	192	I. L.	10 51 27.92	2.11561	66.47	+ 2 13 19.3	-2.96196
12	193	I. U.	11 17 35.64	2.11711	66.62	- 0 50 48.1	-2.95523
12	193	I. L.	11 43 52.58	2.12090	66.95	- 3 55 3.8	-2.93861
13	194	I. U.	12 10 27.30	2.12700	67.44	- 6 56 56.5	-2.95378
13	195	I. L.	12 37 28.21	2.13519	68.11	- 9 53 49.7	-2.93829
14	195	I. U.	13 5 3.22	2.14514	68.94	-12 43 1.8	-2.91494
14	196	I. L.	13 33 19.20	2.15640	69.87	-15 21 45.4	-2.88230
15	196	I. U.	14 2 21.12	2.16832	70.96	-17 47 8.5	-2.83901
15	197	I. L.	14 32 11.83	2.18021	71.85	-19 56 17.7	-2.77839
16	197	I. U.	15 2 50.71	2.19120	72.78	-21 46 24.5	-2.69763
16	198	I. L.	15 34 13.43	2.20047	73.57	-23 14 52.5	-2.58479
17	198	I. U.	16 6 11.46	2.20705	74.13	-24 19 28.8	-2.41539
17	199	I. L.	16 38 32.44	2.21035	74.40	-24 58 35.2	-2.11354
18	199	I. U.	17 11 1.02	2.21005	74.35	-25 11 17.5	+0.46835
18	200	I. L.	17 43 20.44	2.20597	73.96	-24 57 33.9	+2.12594
19	200	I. U.	18 15 14.04	2.19822	73.26	-24 18 12.9	+2.41229
19	201	I. L.	18 46 27.58	2.18745	72.29	-23 14 51.4	+2.57201
20	201	I. U.	19 16 50.02	2.17412	71.14	-21 49 43.0	+2.67767
20	202	I. L.	19 46 14.15	2.15912	69.88	-20 5 27.0	+2.75166
21	202	II. U.	20 16 53.97	2.14333	68.57	-18 4 55.1	+2.80509
22	203	II. L.	20 44 12.85	2.12746	67.29	-15 51 1.7	+2.84390
22	203	II. U.	21 10 33.73	2.11213	66.09	-13 26 35.0	+2.87164
23	204	II. L.	21 36 1.80	2.09802	65.00	-10 54 12.0	+2.89075
23	204	II. U.	22 0 43.54	2.08547	64.06	- 8 16 16.1	+2.90303
24	205	II. L.	22 24 46.31	2.07489	63.28	- 5 34 55.8	+2.90853
24	205	II. U.	22 48 17.84	2.06652	62.69	- 2 52 5.2	+2.91115
25	206	II. L.	23 11 26.02	2.06043	62.27	- 0 9 26.0	+2.90662
25	206	II. U.	23 34 18.72	2.05675	62.02	+ 2 31 30.9	+2.90809
26	207	II. L.	23 57 3.72	2.05553	61.96	+ 5 9 23.1	+2.89179
26	208	II. U.	0 19 48.49	2.05660	62.06	+ 7 42 53.9	+2.87774

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Mean Solar Date.	Sidereal Date.	Limb and Translt.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
July 27	208 ^d	II. L.	0 42 40.96	2.05994	62.33	+10° 10' 50.7	+2.85963
27	209	II. v.	1 5 45.95	2.06543	62.74	+12 32 2.4	+2.83702
28	209	II. L.	1 29 12.00	2.07258	63.29	+14 45 17.5	+2.80905
28	210	II. v.	1 53 4.24	2.08131	63.96	+16 49 22.2	+2.77471
29	210	II. L.	2 17 27.83	2.09132	64.73	+18 42 58.9	+2.73216
29	211	II. v.	2 42 26.81	2.10202	65.56	+20 24 46.6	+2.67861
30	211	II. L.	3 8 4.13	2.11311	66.42	+21 53 20.9	+2.60991
30	212	II. v.	3 34 21.04	2.12401	67.27	+23 7 12.9	+2.51871
31	212	II. L.	4 1 17.07	2.13430	68.07	+24 4 54.9	+2.39035
31	213	II. v.	4 26 49.74	2.14342	68.79	+24 45 2.3	+2.18893
Aug. 1	213	II. L.	4 56 54.54	2.15097	69.39	+25 6 17.4	+1.75747
1	214	II. v.	5 25 25.10	2.15658	69.82	+25 7 33.9	-1.65302
2	214	II. L.	5 54 13.56	2.16002	70.07	+24 48 5.6	-2.17644
2	215	II. v.	6 23 11.35	2.16125	70.15	+24 7 27.1	-2.40907
3	215	II. L.	6 52 9.78	2.16038	70.04	+23 5 39.0	-2.55780
3	216	II. v.	7 21 0.84	2.15764	69.78	+21 43 9.0	-2.66544
4	216	II. L.	7 49 38.06	2.15348	69.41	+20 0 52.8	-2.74719
4	217	II. v.	8 17 56.82	2.14833	68.97	+18 0 9.9	-2.81078
5	217	II. L.	8 45 54.65	2.14276	68.51	+15 42 43.2	-2.86074
6	218	I. v.	9 11 15.22	2.13742	68.07	+13 10 33.7	-2.89975
6	218	I. L.	9 38 33.37	2.13268	67.68	+10 25 57.9	-2.92944
7	219	I. v.	10 5 35.60	2.12911	67.41	+ 7 31 23.2	-2.95109
7	219	I. L.	10 32 27.03	2.12704	67.25	+ 4 29 26.3	-2.96552
8	220	I. v.	10 59 13.79	2.12681	67.24	+ 1 22 49.4	-2.97314
8	220	I. L.	11 26 2.84	2.12850	67.41	- 1 45 39.8	-2.97424
9	221	I. v.	11 53 1.69	2.13220	67.73	- 4 53 11.1	-2.96869
9	222	I. L.	12 20 17.88	2.13777	68.22	- 7 56 52.6	-2.95621
10	222	I. v.	12 47 58.61	2.14526	68.85	-10 53 50.8	-2.93611
10	223	I. L.	13 16 10.36	2.15403	69.60	-13 41 11.5	-2.90737
11	223	I. v.	13 44 58.31	2.16361	70.42	-16 16 2.4	-2.86824
11	224	I. L.	14 14 25.63	2.17345	71.28	-18 35 35.4	-2.81626
12	224	I. v.	14 44 33.05	2.18293	72.10	-20 37 10.3	-2.74693
12	225	I. L.	15 15 18.19	2.19117	72.82	-22 18 20.5	-2.65432
13	225	I. v.	15 46 35.22	2.19753	73.38	-23 37 0.1	-2.52401
13	226	I. L.	16 18 15.05	2.20137	73.70	-24 31 32.0	-2.32226
14	226	I. v.	16 50 5.68	2.20216	73.77	-25 0 54.9	-1.92028
14	227	I. L.	17 21 53.45	2.19984	73.53	-25 4 48.9	+1.64197
15	227	I. v.	17 53 24.13	2.19415	73.02	-24 43 37.8	+2.22290
15	228	I. L.	18 24 24.57	2.18551	72.24	-23 58 26.2	+2.45242
16	228	I. v.	18 54 43.86	2.17455	71.26	-22 50 53.8	+2.59121
16	229	I. L.	19 24 13.99	2.16170	70.15	-21 23 7.5	+2.68623
17	229	I. v.	19 52 50.32	2.14777	68.96	-19 37 32.2	+2.75451
17	230	I. L.	20 20 31.30	2.13328	67.75	-17 36 40.7	+2.80489
18	230	I. v.	20 47 18.07	2.11902	66.59	-15 23 8.1	+2.84213
18	231	I. L.	21 13 13.97	2.10544	65.51	-12 59 24.9	+2.86919
19	231	I. v.	21 38 23.77	2.09311	64.54	-10 27 54.5	+2.88830
20	232	II. L.	22 5 0.96	2.08228	63.71	- 7 50 50.3	+2.90079
20	232	II. v.	22 28 55.82	2.07328	63.00	- 5 10 15.5	+2.90763
21	233	II. L.	22 52 24.45	2.06629	62.52	- 2 28 3.3	+2.90960
21	233	II. v.	23 15 33.88	2.06138	62.17	+ 0 14 2.9	+2.90723

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Aug. 22	234 ^d	II. L.	^{h m s} 23 38 31.12	2.05862	61.99	+ 2° 54' 23.1	+2.90058
	235	II. v.	0 1 23.09	2.05805	61.98	+ 5 31 43.9	+2.88986
	235	II. L.	0 24 16.46	2.05953	62.12	+ 8 4 27.7	+2.87513
	236	II. v.	0 47 17.62	2.06296	62.39	+10 31 21.0	+2.85590
	236	II. L.	1 10 32.63	2.06815	62.81	+12 51 6.5	+2.83177
	237	II. v.	1 34 7.00	2.07489	63.34	+15 2 29.2	+2.80195
	237	II. L.	1 58 5.76	2.08289	63.97	+17 4 13.7	+2.76527
	238	II. v.	2 22 33.12	2.09184	64.69	+18 55 3.6	+2.71991
	238	II. L.	2 47 32.34	2.10147	65.46	+20 33 40.8	+2.66309
	239	II. v.	3 13 5.58	2.11133	66.24	+21 58 46.6	+2.59044
	239	II. L.	3 39 13.68	2.12097	67.02	+23 9 2.3	+2.49428
	240	II. v.	4 5 55.90	2.12998	67.75	+24 3 10.7	+2.38554
	240	II. L.	4 33 9.97	2.13799	68.40	+24 39 58.5	+2.14208
	241	II. v.	5 0 51.96	2.14467	68.94	+24 58 19.6	+1.64414
	241	II. L.	5 28 56.58	2.14971	69.34	+24 57 18.8	-1.73767
	242	II. v.	5 57 17.50	2.15299	69.59	+24 36 15.4	-2.19382
	242	II. L.	6 25 47.84	2.15452	69.69	+23 54 46.1	-2.41273
	243	II. v.	6 54 20.81	2.15436	69.65	+22 52 48.5	-2.55718
	243	II. L.	7 22 50.23	2.15278	69.48	+21 30 41.6	-2.66273
	244	II. v.	7 51 11.18	2.15011	69.24	+19 49 6.9	-2.74419
Sept. 1	244	II. L.	8 19 20.25	2.14675	68.92	+17 49 8.2	-2.80658
	245	II. v.	8 47 15.85	2.14323	68.59	+15 32 11.1	-2.86994
	245	II. L.	9 14 58.30	2.13997	68.30	+13 0 0.7	-2.90066
	246	II. v.	9 42 29.57	2.13748	68.09	+10 14 40.3	-2.93237
	246	II. L.	10 9 53.28	2.13602	67.96	+ 7 18 31.1	-2.95596
	247	II. v.	10 37 14.22	2.13506	67.92	+ 4 14 9.3	-2.97205
	247	I. L.	11 2 22.22	2.13767	68.04	+ 1 4 24.9	-2.98089
	248	I. v.	11 29 55.41	2.14117	68.33	- 2 7 40.6	-2.98276
	248	I. L.	11 57 44.66	2.14631	68.76	- 5 18 55.3	-2.97708
	249	I. v.	12 25 56.95	2.15302	69.33	- 8 26 1.0	-2.96351
	250	I. L.	12 54 37.99	2.16107	70.02	-11 25 35.3	-2.94122
	250	I. v.	13 23 52.80	2.16991	70.79	-14 14 16.9	-2.90684
	251	I. L.	13 53 44.48	2.17903	71.61	-16 48 48.9	-2.86451
	251	I. v.	14 24 13.76	2.18777	72.40	-19 6 6.9	-2.80512
	252	I. L.	14 55 18.44	2.19543	73.08	-21 3 21.1	-2.72562
	252	I. v.	15 26 52.87	2.20132	73.64	-23 38 10.5	-2.61787
	253	I. L.	15 58 48.41	2.20477	73.96	-23 48 47.5	-2.46277
	253	I. v.	16 30 53.39	2.20520	74.03	-24 34 3.1	-2.20822
	254	I. L.	17 2 54.51	2.20265	73.83	-24 53 31.7	-1.53009
	254	I. v.	17 34 37.99	2.19703	73.33	-24 47 33.0	+1.96407
	255	I. L.	18 5 50.78	2.18845	72.57	-24 17 7.8	+2.32375
	255	I. v.	18 36 22.13	2.17742	71.61	-23 23 50.9	+2.50562
	256	I. L.	19 6 4.05	2.16462	70.50	-22 9 43.1	+2.62214
	256	I. v.	19 34 51.83	2.15070	69.30	-20 37 1.0	+2.70400
	257	I. L.	20 2 43.76	2.13609	68.09	-18 48 10.8	+2.76380
	257	I. v.	20 29 40.91	2.12172	66.90	-16 45 36.9	+2.80626
	258	I. L.	20 55 46.39	2.10806	65.78	-14 31 41.6	+2.84148
	258	I. v.	21 21 4.94	2.09548	64.77	-12 8 40.0	+2.86563
	259	I. L.	21 45 42.34	2.08433	63.89	- 9 38 39.2	+2.88319
	259	I. v.	22 9 45.00	2.07500	63.15	- 7 3 37.6	+2.89458

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Sept. 16	^d 260	I. L.	^{h m s} 22 33 19.66	2.06759	^s 62.57	— 4° 25' 25.8"	+2.90086
17	260	I. v.	22 56 33.21	2.06202	62.15	— 1 45 46.8	+2.90263
17	261	I. L.	23 19 32.45	2.05877	61.90	+ 0 53 42.3	+2.90000
18	261	II. v.	23 44 27.57	2.05751	61.78	+ 3 31 29.0	+2.89330
19	262	II. L.	0 7 17.93	2.05816	61.84	+ 6 6 6.1	+2.88242
19	263	II. v.	0 30 13.38	2.06070	62.03	+ 8 36 8.6	+2.86712
20	263	II. L.	0 53 19.60	2.06491	62.34	+11 0 13.5	+2.84712
20	264	II. v.	1 16 41.81	2.07059	62.78	+13 17 0.1	+2.82175
21	264	II. L.	1 40 24.66	2.07751	63.33	+15 25 7.7	+2.79014
21	265	II. v.	2 4 31.98	2.08536	63.96	+17 23 16.8	+2.75092
22	265	II. L.	2 29 6.87	2.09384	64.64	+19 10 8.1	+2.70230
22	266	II. v.	2 54 11.36	2.10257	65.35	+20 44 23.6	+2.64114
23	266	II. L.	3 19 46.96	2.11123	66.06	+22 4 47.5	+2.56267
23	267	II. v.	3 45 51.19	2.11939	66.73	+23 10 6.7	+2.45785
24	267	II. L.	4 12 24.38	2.12665	67.34	+23 59 13.0	+2.30803
24	268	II. v.	4 39 22.75	2.13290	67.88	+24 31 6.5	+2.06021
25	268	II. L.	5 6 42.08	2.13783	68.31	+24 44 56.0	+1.35660
25	269	II. v.	5 34 17.21	2.14126	68.60	+24 40 1.3	—1.85854
26	269	II. L.	6 2 2.61	2.14314	68.77	+24 15 56.7	—2.22704
26	270	II. v.	6 29 52.63	2.14370	68.82	+23 32 32.4	—2.42387
27	270	II. L.	6 57 42.11	2.14892	68.75	+22 29 52.8	—2.55759
27	271	II. v.	7 25 26.82	2.14114	68.60	+21 8 19.3	—2.65703
28	271	II. L.	7 53 3.76	2.13890	68.39	+19 28 30.1	—2.73501
28	272	II. v.	8 20 31.47	2.13650	68.16	+17 31 18.4	—2.79767
29	272	II. L.	8 47 50.05	2.13421	67.94	+15 17 53.2	—2.84848
29	273	II. v.	9 15 1.21	2.13258	67.77	+12 49 39.8	—2.88954
30	273	II. L.	9 42 8.20	2.13200	67.70	+10 8 18.5	—2.92245
30	274	II. v.	10 9 15.51	2.13290	67.73	+ 7 15 46.4	—2.94789
Oct. 1	274	II. L.	10 36 28.71	2.13536	67.89	+ 4 14 19.3	—2.96632
1	275	II. v.	11 3 54.28	2.13941	68.18	+ 1 6 31.1	—2.97783
2	275	II. L.	11 31 39.32	2.14538	68.64	— 2 4 46.0	—2.98226
2	276	II. v.	11 59 50.93	2.15311	69.26	— 5 16 21.5	—2.97909
3	277	II. L.	12 28 35.91	2.16230	70.01	— 8 24 46.5	—2.96759
4	277	I. v.	12 55 38.48	2.17263	70.88	—11 26 19.2	—2.94660
4	278	I. L.	13 25 44.68	2.18344	71.81	—14 17 13.3	—2.91454
5	278	I. v.	13 56 36.55	2.19418	72.75	—16 53 38.4	—2.86899
5	279	I. L.	14 28 13.01	2.20393	73.65	—19 11 53.9	—2.80626
6	279	I. v.	15 0 29.27	2.21189	74.39	—21 8 42.4	—2.72066
6	280	I. L.	15 33 16.34	2.21733	74.92	—22 41 20.4	—2.60076
7	280	I. v.	16 6 21.58	2.21956	75.16	—23 47 50.1	—2.42326
7	281	I. L.	16 39 29.42	2.21817	75.07	—24 27 8.5	—2.10738
8	281	I. v.	17 12 23.16	2.21307	74.65	—24 39 10.7	+0.85300
8	282	I. L.	17 44 46.62	2.20453	73.92	—24 24 46.4	+2.13354
9	282	I. v.	18 16 25.92	2.19293	72.93	—23 45 32.3	+2.40627
9	283	I. L.	18 47 10.59	2.17906	71.74	—22 43 38.8	+2.55855
10	283	I. v.	19 16 54.08	2.16364	70.43	—21 21 38.2	+2.65884
10	284	I. L.	19 45 33.76	2.14746	69.08	—19 42 11.2	+2.72956
11	284	I. v.	20 13 10.42	2.13127	67.75	—17 47 56.1	+2.78089
11	285	I. L.	20 39 47.36	2.11571	66.49	—15 41 26.6	+2.81886
12	285	I. v.	21 6 29.75	2.10130	65.33	—13 25 5.2	+2.84683

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	^d		^{h m s}		^s	^{° ' "}	
Oct. 12	286	I. L.	21 30 24.17	2.08842	64.31	-11 1 0.5	+2.86706
13	286	I. U.	21 54 37.85	2.07737	63.44	- 8 31 10.4	+2.88110
13	287	I. L.	22 18 18.31	2.06856	62.74	- 5 57 22.4	+2.88991
14	287	I. U.	22 41 33.19	2.06187	62.20	- 3 21 15.4	+2.89419
14	288	I. L.	23 4 29.94	2.05744	61.84	- 0 44 20.8	+2.89439
15	288	I. U.	23 27 15.84	2.05519	61.64	+ 1 51 54.7	+2.89055
15	289	I. L.	23 49 57.81	2.05507	61.59	+ 4 26 7.3	+2.88988
16	290	I. U.	0 12 42.35	2.05606	61.71	+ 6 56 55.6	+2.87114
16	290	I. L.	0 35 35.53	2.06081	61.97	+ 9 22 58.2	+2.85497
17	291	I. U.	0 58 43.05	2.06606	62.33	+11 42 54.0	+2.83379
17	291	I. L.	1 22 9.65	2.07269	62.82	+13 55 20.7	+2.80698
18	292	II. U.	1 48 6.37	2.08034	63.41	+15 58 55.8	+2.77337
19	292	II. L.	2 12 24.14	2.08870	64.05	+17 52 16.4	+2.73138
19	293	II. U.	2 37 10.73	2.09733	64.72	+19 33 59.4	+2.67869
20	293	II. L.	3 2 26.98	2.10582	65.40	+21 2 44.3	+2.61189
20	294	II. U.	3 28 12.50	2.11384	66.05	+22 17 14.2	+2.52467
21	294	II. L.	3 54 25.40	2.12100	66.65	+23 16 16.8	+2.40613
21	295	II. U.	4 21 2.38	2.12701	67.16	+23 58 50.3	+2.23076
22	295	II. L.	4 47 59.01	2.13159	67.57	+24 24 3.1	+1.91089
22	296	II. U.	5 15 9.89	2.13459	67.86	+24 31 15.6	-0.99520
23	296	II. L.	5 42 29.11	2.13605	68.01	+24 20 3.6	-2.01038
23	297	II. U.	6 9 50.76	2.13506	68.04	+23 50 18.6	-2.29008
24	297	II. L.	6 37 9.43	2.13466	67.96	+23 2 7.9	-2.45708
24	298	II. U.	7 4 20.57	2.13220	67.78	+21 55 52.7	-2.57462
25	298	II. L.	7 31 21.02	2.12895	67.54	+20 32 7.6	-2.66389
25	299	II. U.	7 58 9.17	2.12545	67.28	+18 51 39.8	-2.73444
26	299	II. L.	8 24 44.90	2.12225	67.02	+16 55 26.6	-2.79149
26	300	II. U.	8 51 9.83	2.11978	66.81	+14 44 34.8	-2.63812
27	300	II. L.	9 17 27.12	2.11830	66.66	+12 20 20.4	-2.57637
27	301	II. U.	9 43 41.31	2.11793	66.63	+ 9 44 8.7	-2.90744
28	301	II. L.	10 9 58.15	2.11959	66.72	+ 6 57 37.6	-2.93209
28	302	II. U.	10 36 24.50	2.12320	66.98	+ 4 2 37.4	-2.95075
29	302	II. L.	11 3 7.90	2.12888	67.40	+ 1 1 14.4	-2.96331
29	303	II. U.	11 30 16.55	2.13672	67.99	- 2 4 6.9	-2.96953
30	303	II. L.	11 57 58.79	2.14659	68.76	- 5 10 40.7	-2.96882
30	304	II. U.	12 26 22.78	2.15821	69.69	- 8 15 19.4	-2.96032
31	305	II. L.	12 55 35.80	2.17114	70.74	-11 14 33.6	-2.94268
31	305	II. U.	13 25 43.63	2.18483	71.89	-14 4 34.7	-2.91403
Nov. 1	306	II. L.	13 56 49.42	2.19844	73.06	-16 41 21.7	-2.87155
1	306	I. U.	14 26 24.37	2.21104	74.17	-19 0 51.0	-2.81128
2	307	I. L.	14 59 18.18	2.22168	75.13	-20 59 11.6	-2.72668
3	307	I. U.	15 32 55.04	2.22935	75.84	-22 33 1.6	-2.60545
3	308	I. L.	16 6 59.73	2.23320	76.22	-23 39 46.6	-2.41986
4	308	I. U.	16 41 13.41	2.23274	76.22	-24 17 56.0	-2.07243
4	309	I. L.	17 15 15.27	2.22784	75.81	-24 27 10.5	+1.40226
5	309	I. U.	17 48 44.99	2.21872	75.03	-24 8 19.3	+2.20844
5	310	I. L.	18 21 25.10	2.20593	73.92	-23 23 14.9	+2.45747
6	310	I. U.	18 53 2.61	2.19044	72.61	-22 14 34.4	+2.59922
6	311	I. L.	19 23 29.71	2.17207	71.15	-20 45 19.8	+2.69227
7	311	I. U.	19 52 43.53	2.15494	69.64	-18 58 41.0	+2.75705

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Nov. 7	312 ^d	I. L.	^{h m s} 20 30 45.33	2.13675	68.18	-16° 57' 44.2	+2.80316
8	312	I. U.	20 47 39.56	2.11945	66.80	-14 45 22.4	+2.83625
8	313	I. L.	21 13 32.80	2.10356	65.54	-12 24 11.5	+2.85976
9	313	I. U.	21 38 32.88	2.08945	64.44	-9 56 29.1	+2.87588
9	314	I. L.	22 2 48.31	2.07748	63.52	-7 24 16.0	+2.88612
10	314	I. U.	22 26 27.82	2.06796	62.79	-4 49 18.0	+2.89154
10	315	I. L.	22 49 40.05	2.06089	62.24	-2 13 9.3	+2.89279
11	315	I. U.	23 12 33.37	2.05633	61.87	+0 22 45.0	+2.89020
11	316	I. L.	23 35 15.82	2.05415	61.68	+2 57 5.6	+2.88405
12	316	I. U.	23 57 55.03	2.05434	61.66	+5 28 38.3	+2.87428
12	317	I. L.	0 20 38.11	2.05679	61.80	+7 56 9.5	+2.86060
13	318	I. U.	0 43 31.64	2.06119	62.08	+10 18 24.0	+2.84259
13	318	I. L.	1 6 41.56	2.06722	62.48	+12 34 6.7	+2.81966
14	319	I. U.	1 30 13.05	2.07463	63.01	+14 41 59.6	+2.79081
14	319	I. L.	1 54 10.46	2.08304	63.61	+16 40 42.4	+2.75460
15	320	I. U.	2 18 36.98	2.09202	64.27	+18 28 52.1	+2.70933
15	320	I. L.	2 43 34.60	2.10123	64.95	+20 5 5.2	+2.65220
16	321	I. U.	3 9 3.76	2.11008	65.64	+21 27 59.3	+2.57863
16	321	II. L.	3 37 15.94	2.11817	66.28	+22 36 14.6	+2.48084
17	322	II. U.	4 3 44.37	2.12512	66.84	+23 28 38.8	+2.34363
18	322	II. L.	4 30 35.88	2.13066	67.29	+24 4 9.7	+2.12650
18	323	II. U.	4 57 44.74	2.13443	67.61	+24 21 58.0	+1.63939
19	323	II. L.	5 25 4.27	2.13631	67.80	+24 21 31.6	-1.68413
19	324	II. U.	5 52 27.37	2.13637	67.83	+24 2 36.2	-2.14863
20	324	II. L.	6 19 47.21	2.13462	67.73	+23 25 15.5	-2.36611
20	325	II. U.	6 46 57.70	2.13146	67.52	+22 29 51.3	-2.50672
21	325	II. L.	7 13 54.09	2.12714	67.21	+21 17 3.0	-2.60868
21	326	II. U.	7 40 33.23	2.12218	66.86	+19 47 42.0	-2.68703
22	326	II. L.	8 6 53.68	2.11704	66.48	+18 2 51.1	-2.74908
22	327	II. U.	8 32 55.94	2.11224	66.13	+16 3 41.0	-2.79903
23	327	II. L.	8 58 42.18	2.10816	65.83	+13 51 29.3	-2.83967
23	328	II. U.	9 24 16.18	2.10541	65.62	+11 27 38.2	-2.87275
24	328	II. L.	9 49 43.16	2.10425	65.54	+8 53 34.8	-2.89938
24	329	II. U.	10 15 9.51	2.10507	65.60	+6 10 52.2	-2.92033
25	329	II. L.	10 40 42.59	2.10813	65.83	+3 21 10.3	-2.93596
25	330	II. U.	11 6 30.63	2.11354	66.24	+0 26 19.2	-2.94635
26	330	II. L.	11 32 42.47	2.12136	66.84	-2 31 38.9	-2.95129
26	331	II. U.	11 59 27.25	2.13149	67.62	-5 30 26.1	-2.95022
27	332	II. L.	12 26 54.18	2.14367	68.58	-8 27 25.3	-2.94231
27	332	II. U.	12 55 11.91	2.15776	69.71	-11 19 38.7	-2.92625
28	333	II. L.	13 24 27.86	2.17295	70.95	-14 3 47.6	-2.90009
28	333	II. U.	13 54 47.35	2.18845	72.24	-16 36 12.8	-2.86117
29	334	II. L.	14 26 12.53	2.20358	73.53	-18 53 4.6	-2.80540
29	334	II. U.	14 58 41.08	2.21706	74.70	-20 50 30.6	-2.72602
30	335	II. L.	15 32 5.33	2.22794	75.67	-22 24 49.2	-2.61079
30	335	II. U.	16 6 11.89	2.23507	76.32	-23 32 59.2	-2.43350
Dec. 1	336	I. L.	16 38 9.06	2.23782	76.58	-24 12 49.3	-2.10054
2	336	I. U.	17 12 41.57	2.23581	76.41	-24 23 19.0	+1.32098
2	337	I. L.	17 46 53.95	2.22907	75.81	-24 4 44.6	+2.21341
3	337	I. U.	18 20 25.17	2.21801	74.85	-23 18 35.2	+2.47132

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Dec. 3	^d 338	I. L.	^{h m s} 18 52 58.43	2.20350	^s 73.59	— 22° 7' 20.4	+2.61682
4	338	I. U.	19 24 22.26	2.18656	72.14	— 20 34 8.9	+2.71182
4	339	I. L.	19 54 30.97	2.16817	70.62	— 18 42 27.9	+2.77721
5	339	I. U.	20 23 23.87	2.14931	69.10	— 16 35 47.5	+2.82220
5	340	I. L.	20 51 4.21	2.13114	67.64	— 14 17 25.8	+2.85486
6	340	I. U.	21 17 38.10	2.11398	66.29	— 11 50 22.0	+2.87650
6	341	I. L.	21 43 13.37	2.09868	65.12	— 9 17 13.4	+2.89046
7	341	I. U.	22 7 58.77	2.08572	64.14	— 6 40 17.3	+2.89802
7	342	I. L.	22 32 3.56	2.07500	63.34	— 4 1 30.5	+2.90069
8	342	I. U.	22 55 36.91	2.06685	62.73	— 1 22 33.6	+2.89908
8	343	I. L.	23 18 47.79	2.06130	62.31	+ 1 15 5.0	+2.89362
9	343	I. U.	23 41 44.80	2.05835	62.08	+ 3 50 7.3	+2.88457
9	344	I. L.	0 4 36.10	2.05703	62.04	+ 6 21 20.5	+2.87196
10	345	I. U.	0 27 29.39	2.05983	62.15	+ 8 47 35.6	+2.85550
10	345	I. L.	0 50 31.75	2.06378	62.42	+ 11 7 44.9	+2.83480
11	346	I. U.	1 13 49.66	2.06959	62.82	+ 13 20 38.9	+2.80913
11	346	I. L.	1 37 28.80	2.07693	63.33	+ 15 25 6.5	+2.77754
12	347	I. U.	2 1 33.97	2.08536	63.93	+ 17 19 53.2	+2.73839
12	347	I. L.	2 26 8.78	2.09458	64.59	+ 19 3 41.2	+2.69867
13	348	I. U.	2 51 15.60	2.10401	65.28	+ 20 35 10.6	+2.62777
13	348	I. L.	3 16 55.20	2.11314	65.97	+ 21 53 1.2	+2.54759
14	349	I. U.	3 43 6.65	2.12163	66.61	+ 22 55 54.6	+2.43943
14	349	I. L.	4 9 47.15	2.12888	67.15	+ 23 42 37.7	+2.38215
15	350	I. U.	4 36 52.06	2.13459	67.61	+ 24 12 7.2	+2.01242
15	350	I. L.	5 4 15.38	2.13849	67.90	+ 24 23 33.4	+1.03862
16	351	I. U.	5 31 49.94	2.14035	68.05	+ 24 16 23.7	— 1.91814
17	351	II. L.	6 1 44.06	2.13913	68.04	+ 23 50 25.8	— 2.24741
17	352	II. U.	6 29 17.67	2.13792	67.88	+ 23 5 47.8	— 2.43001
18	352	II. L.	6 56 40.07	2.13411	67.60	+ 22 2 58.4	— 2.55420
18	353	II. U.	7 23 45.85	2.12927	67.22	+ 20 42 46.2	— 2.64613
19	353	II. L.	7 50 31.25	2.12343	66.78	+ 19 6 15.6	— 2.71704
19	354	II. U.	8 16 54.51	2.11727	66.33	+ 17 14 43.3	— 2.77300
20	354	II. L.	8 42 55.76	2.11140	65.90	+ 15 9 34.7	— 2.81771
20	355	II. U.	9 8 36.94	2.10616	65.52	+ 12 52 23.1	— 2.85338
21	355	II. L.	9 34 1.71	2.10212	65.25	+ 10 24 45.4	— 2.88165
21	356	II. U.	9 59 15.07	2.09972	65.07	+ 7 48 21.8	— 2.90361
22	356	II. L.	10 24 23.24	2.09934	65.06	+ 5 4 55.5	— 2.92004
22	357	II. U.	10 49 33.41	2.10096	65.21	+ 2 16 13.1	— 2.93130
23	357	II. L.	11 14 53.55	2.10490	65.53	— 0 35 54.2	— 2.93743
23	358	II. U.	11 40 32.21	2.11140	66.05	— 3 29 27.7	— 2.93846
24	359	II. L.	12 6 38.31	2.12028	66.75	— 6 22 19.2	— 2.93399
24	360	II. U.	12 33 20.79	2.13133	67.62	— 9 12 9.3	— 2.92304
25	360	II. L.	13 0 48.29	2.14423	68.66	— 11 56 24.2	— 2.90451
25	360	II. U.	13 29 8.52	2.15857	69.82	— 14 32 14.6	— 2.87680
26	361	II. L.	13 58 27.62	2.17365	71.07	— 16 56 35.7	— 2.83732
26	361	II. U.	14 28 49.04	2.18868	72.32	— 19 6 11.4	— 2.78905
27	362	II. L.	15 0 12.72	2.20268	73.52	— 20 57 39.7	— 2.70459
27	362	II. U.	15 32 34.00	2.21468	74.56	— 22 27 45.0	— 2.59321
28	363	II. L.	16 5 43.18	2.22370	75.34	— 23 33 31.6	— 2.42159
28	363	II. U.	16 39 25.41	2.22891	75.79	— 24 12 42.9	— 2.10295

MOON CULMINATIONS, 1861. 319

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascen- sion for 1 hour of Longitude.	Sidereal Time of Semi- diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Dec. 29	^d 364	II. L.	^h 17 ^m 13 ^s 21.94	2.22976	^s 75.84	—24° 23' 55.7	+1.17173
29	364	II. U.	17 47 11.93	2.22611	75.50	—24 6 52.3	+2.19066
30	365	II. L.	18 20 34.96	2.21822	74.78	—23 22 24.0	+2.45951
31	365	I. U.	18 50 45.82	2.20661	73.75	—22 12 24.4	+2.61240
31	366	I. L.	19 22 28.64	2.19223	72.51	—20 39 34.9	+2.71256

320 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	35 Piscium.	d Piscium.	44 Piscium.	13 Ceti.	δ Piscium.	20 Ceti.	
	0 ^h 7 ^m	0 ^h 13 ^m	0 ^h 18 ^m	0 ^h 28 ^m	0 ^h 41 ^m	0 ^h 45 ^m	
d							
16	49.91	27.66	17.45	5.81	29.26	55.94	-.009
44	49.69	27.42	17.21	5.56	28.98	54.96	-.001
126	50.38	28.07	17.81	6.07	29.40	55.34	+.018
153	51.12	29.80	18.52	6.76	30.09	56.01	.029
180	51.98	29.66	19.37	7.61	30.94	56.84	.032
208	52.81	30.50	20.21	8.46	31.80	57.69	.028
235	53.42	31.13	20.84	9.12	32.48	58.38	.019
262	53.79	31.50	21.23	9.53	32.92	58.83	.011
289	53.88	31.61	21.35	9.68	33.11	59.02	+.003
317	53.76	31.50	21.25	9.59	33.07	58.99	-.005
344	53.51	31.26	21.01	9.36	32.87	58.79	-.011
Dec. =	+ 8° 3'	+ 7° 25'	+ 1° 10'	- 4° 22'	+ 6° 50'	- 1° 54'	
Mag. =	6	6.5	6	6.5	4.5	5.6	
	ε Piscium.	ε Piscium.	ζ ¹ Piscium.	40 Ceti.	μ Piscium.	η Piscium.	
	0 ^h 55 ^m	1 ^h 1 ^m	1 ^h 6 ^m	1 ^h 9 ^m	1 ^h 22 ^m	1 ^h 24 ^m	
18	45.10	13.61	29.40	53.04	55.35	4.18	-.008
45	44.80	13.31	29.10	52.74	55.03	3.84	-.009
127	45.15	13.61	29.36	52.95	55.17	3.98	+.019
154	45.82	14.27	30.02	53.59	55.79	4.62	.028
181	46.67	15.10	30.85	54.41	56.61	5.46	.031
209	47.53	15.96	31.73	55.27	57.49	6.36	.029
236	48.23	16.66	32.44	55.98	58.22	7.11	.023
263	48.70	17.14	32.94	56.48	58.75	7.67	.013
290	48.92	17.37	33.19	56.74	59.05	7.97	+.005
318	48.91	17.37	33.20	56.75	59.11	8.04	-.002
345	48.73	17.21	33.05	56.59	58.99	7.92	-.010
Dec. =	+ 7° 9'	+ 4° 55'	+ 6° 50'	- 3° 0'	+ 5° 26'	+ 14° 38'	
Mag. =	4	6.5	5.4	6	5	4.3	
	π Piscium.	ν Piscium.	ο Piscium.	ι Arietis.	ξ ¹ Ceti.	δ Arietis.	
	1 ^h 29 ^m	1 ^h 34 ^m	1 ^h 38 ^m	1 ^h 49 ^m	2 ^h 5 ^m	2 ^h 10 ^m	
18	45.15	13.19	4.62	47.11	39.50	25.50	-.014
46	44.81	12.85	4.27	46.74	39.13	25.12	.011
73	44.59	12.62	4.04	46.47	38.84	24.79	-.006
155	45.57	13.54	4.94	47.33	39.54	25.51	+.026
182	46.39	14.34	5.75	48.15	40.31	26.32	.031
209	47.25	15.19	6.61	49.04	41.16	27.21	.031
237	48.02	15.97	7.39	49.86	41.98	28.05	.025
264	48.56	16.49	7.94	50.46	42.59	28.71	.018
291	48.87	16.81	8.27	50.84	42.99	29.14	.010
319	48.96	16.90	8.38	50.99	43.17	29.36	+.001
346	48.85	16.80	8.29	50.92	43.14	29.36	-.007
Dec. =	+ 11° 26'	+ 4° 47'	+ 8° 27'	+ 17° 8'	+ 8° 12'	+ 19° 15'	
Mag. =	6	5.4	4	6	4.5	6.5	
	ξ ² Ceti.	38 Arietis.	π Arietis.	ρ ² Arietis.	ο Arietis.	53 Arietis.	
	2 ^h 20 ^m	2 ^h 37 ^m	2 ^h 41 ^m	2 ^h 48 ^m	2 ^h 51 ^m	2 ^h 59 ^m	
19	47.78	25.00	34.01	37.03	17.85	37.97	-.014
47	47.40	24.62	33.62	36.63	17.44	37.58	.013
74	47.09	24.28	33.26	36.27	17.06	37.19	-.010
156	47.73	24.81	33.79	36.75	17.52	37.58	+.006
183	48.47	25.54	34.52	37.48	18.26	38.29	.030
210	49.32	26.39	35.39	38.35	19.15	39.15	.032
238	50.14	27.24	36.26	39.22	20.04	40.03	.029
265	50.77	27.90	36.95	39.93	20.76	40.76	.023
292	51.21	28.40	37.47	40.46	21.32	41.32	.015
320	51.41	28.65	37.75	40.77	21.63	41.65	+.006
347	51.41	28.69	37.80	40.84	21.71	41.75	.000
Dec. =	+ 7° 50'	+ 11° 52'	+ 16° 53'	+ 17° 29'	+ 20° 47'	+ 17° 20'	
Mag. =	4	5	6.5	6	4.5	6	

MOON-CULMINATING STARS. 321

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	δ Arietis.	ζ Arietis.	τ^1 Arietis.	θ Tauri.	λ Tauri.	γ Tauri.	
	$3^h 3^m$	$3^h 6^m$	$3^h 13^m$	$3^h 28^m$	$3^h 36^m$	$3^h 39^m$	
d	.	.	.	.	.	.
20	42.87	56.79	14.13	49.74	39.53	15.60	-.017
48	42.47	56.38	13.69	49.32	39.12	15.19	.016
75	42.08	55.98	13.31	48.89	38.67	14.74	.013
102	41.88	55.78	13.09	48.63	38.39	14.46	-.003
184	43.20	57.09	14.35	49.80	39.52	15.56	+.030
211	44.07	57.96	15.22	50.67	40.38	16.43	.033
239	44.98	58.84	16.11	51.58	41.29	17.34	.031
266	45.69	59.60	16.88	52.37	42.11	18.16	.026
293	46.26	60.15	17.47	53.01	42.77	18.85	.019
320	46.60	60.53	17.84	53.44	43.22	19.28	+.010
348	46.71	60.65	17.98	53.62	43.43	19.49	.000
Dec. =	$+ 19^\circ 12'$	$+ 20^\circ 32'$	$+ 20^\circ 30'$	$+ 22^\circ 45'$	$+ 23^\circ 40'$	$+ 23^\circ 40'$	
Mag. =	4.5	4.5	5	6	4	3	
	Λ^1 Tauri.	ω^2 Tauri.	δ^1 Tauri.	ν^1 Tauri.	ϵ Tauri.	α Tauri.	
	$3^h 56^m$	$4^h 9^m$	$4^h 14^m$	$4^h 18^m$	$4^h 20^m$	$4^h 27^m$	
	
21	30.95	9.40	57.40	1.74	32.31	59.08	-.015
49	30.54	9.01	57.02	1.35	31.93	58.71	.016
76	30.09	8.56	56.57	0.89	31.46	58.26	.015
103	29.79	8.23	56.24	0.54	31.13	57.91	-.007
185	30.78	9.12	57.07	1.40	31.93	58.64	+.026
212	31.62	9.93	57.86	2.20	32.72	59.40	.031
240	32.53	10.83	58.74	3.11	33.61	60.27	.032
267	33.35	11.65	59.55	3.95	34.43	61.09	.029
294	34.02	12.34	60.24	4.67	35.14	61.80	.023
321	34.51	12.86	60.77	5.22	35.68	62.35	.015
349	34.76	13.14	61.06	5.54	35.99	62.68	+.006
Dec. =	$+ 21^\circ 42'$	$+ 20^\circ 14'$	$+ 17^\circ 13'$	$+ 22^\circ 30'$	$+ 18^\circ 52'$	$+ 16^\circ 14'$	
Mag. =	5.4	6.5	4	5.4	4.3	1	
	τ Tauri.	ι Tauri.	ϵ Aurigæ.	ι Tauri.	λ Orionis.	α Tauri.	
	$4^h 33^m$	$4^h 43^m$	$4^h 47^m$	$4^h 54^m$	$4^h 56^m$	$5^h 10^m$	
	
22	56.60	16.97	59.30	49.85	39.96	58.18	-.009
49	56.24	16.63	58.91	49.52	39.66	57.87	.016
77	55.75	16.15	58.36	48.96	39.19	57.38	.016
104	55.39	15.78	57.93	48.64	38.80	56.96	-.009
186	56.16	16.45	58.65	49.24	39.36	57.45	+.023
213	56.93	17.19	59.47	49.98	40.06	58.16	.030
240	57.81	18.04	60.42	50.83	40.88	59.00	.032
268	58.68	18.90	61.40	51.72	41.74	59.90	.031
295	59.44	19.64	62.25	52.49	42.49	60.69	.026
322	60.02	20.23	62.92	53.12	43.09	61.36	.019
349	60.37	20.59	63.34	53.52	43.48	61.81	+.011
Dec. =	$+ 22^\circ 39'$	$+ 18^\circ 36'$	$+ 32^\circ 57'$	$+ 21^\circ 23'$	$+ 15^\circ 13'$	$+ 21^\circ 57'$	
Mag. =	4.5	5.6	3	5	5	6	
	β Tauri.	ω Tauri.	ζ Tauri.	λ Tauri.	λ Tauri.	λ Geminorum.	
	$5^h 17^m$	$5^h 19^m$	$5^h 29^m$	$5^h 38^m$	$5^h 44^m$	$5^h 55^m$	
	
23	33.09	19.84	22.95	48.54	38.28	43.07	-.006
50	32.76	19.53	22.65	48.27	38.00	42.82	.015
77	32.26	19.06	22.18	47.81	37.51	42.35	.017
105	31.86	18.62	21.74	47.37	37.03	41.88	.012
132	31.62	18.45	21.54	47.16	36.79	41.63	-.002
214	33.05	19.78	22.80	48.30	38.00	42.71	+.028
241	33.92	20.62	23.61	49.08	38.83	43.50	.031
269	34.87	21.51	24.51	49.94	39.77	44.43	.032
296	35.72	22.32	25.32	50.74	40.65	45.26	.029
323	36.44	23.00	26.03	51.44	41.42	46.03	.023
350	36.92	23.47	26.51	51.93	41.97	46.59	+.015
Dec. =	$+ 28^\circ 29'$	$+ 21^\circ 49'$	$+ 21^\circ 3'$	$+ 15^\circ 45'$	$+ 27^\circ 34'$	$+ 23^\circ 16'$	
Mag. =	2	6	3	5	5	5	

322 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	γ Geminorum.	κ Aurigæ.	μ Geminorum.	ν Geminorum.	49 Aurigæ.	σ Geminorum.	
	δ 6° 6'	δ 6° 6'	δ 14°	δ 20°	δ 26°	δ 35°	
23	32.11	34.00	35.85	44.31	29.07	25.71	.000
51	31.80	33.74	35.62	44.09	28.85	25.52	-.013
78	31.43	33.25	35.17	43.65	28.39	25.08	.018
105	30.92	32.77	34.71	43.19	27.90	24.60	.015
133	30.60	32.47	34.42	42.90	27.59	24.27	-.006
215	31.63	33.55	35.38	43.81	28.49	25.09	+.027
242	32.41	34.38	36.15	44.55	29.27	25.84	.030
269	33.26	35.29	37.01	45.39	30.16	26.70	.032
297	34.15	36.23	37.90	46.27	31.10	27.61	.031
324	34.93	37.05	38.69	47.06	31.95	28.46	.027
351	35.50	37.66	39.29	47.66	32.60	29.12	+.021
Dec. =	+ 22° 33'	+ 29° 33'	+ 22° 35'	+ 20° 18'	+ 28° 8'	+ 25° 16'	
Mag. =	4	5.4	3	5.4	6.5	3.4	
	ω Geminorum.	ζ Geminorum.	τ Geminorum.	δ Geminorum.	ϵ Geminorum.	α^3 Geminorum.	
	δ 53°	δ 55°	γ 2°	γ 11°	γ 17°	γ 25°	
24	59.33	54.66	20.48	52.10	8.53	46.96	.000
52	59.18	54.51	20.33	51.99	8.44	46.86	-.010
79	58.76	54.11	19.90	51.60	8.03	46.47	.017
106	58.28	53.64	19.39	51.13	7.53	45.95	.016
134	57.93	53.30	19.01	50.77	7.15	45.53	-.009
215	58.63	53.96	19.66	51.32	7.68	46.00	+.022
243	59.35	54.66	20.40	51.99	8.36	46.69	.028
270	60.18	55.47	21.32	52.88	9.19	47.54	.031
298	61.11	56.36	22.24	53.69	10.14	48.52	.032
325	61.96	57.20	23.15	54.55	11.05	49.47	.030
352	62.64	57.87	23.89	55.27	11.80	50.31	+.027
Dec. =	+ 24° 25'	+ 20° 46'	+ 30° 29'	+ 22° 14'	+ 28° 4'	+ 32° 11'	
Mag. =	6	4	5.4	3.4	4	2.1	
	β Geminorum.	φ Geminorum.	6 Cancri.	12 Cancri.	ζ^1 Cancri.	1 Cancri.	
	γ 36°	γ 45°	γ 55°	δ 0°	δ 4°	δ 12°	
25	51.43	2.34	1.73	58.90	17.12	18.92	.000
52	51.37	2.28	1.72	58.91	17.14	18.96	-.006
80	50.98	1.92	1.37	58.60	16.83	18.65	.015
107	50.48	1.44	0.89	58.18	16.40	18.21	.015
134	50.09	1.04	0.48	57.81	16.02	17.80	.010
162	49.93	0.87	0.29	57.63	15.84	17.59	-.002
244	51.12	2.00	1.34	58.53	16.74	18.47	+.025
271	51.92	2.77	2.11	59.22	17.44	19.18	.030
298	52.82	3.67	3.00	60.03	18.26	20.03	.033
326	53.78	4.63	3.98	60.93	19.17	20.99	.032
353	54.57	5.43	4.80	61.69	19.97	21.83	+.027
Dec. =	+ 28° 22'	+ 27° 7'	+ 28° 11'	+ 14° 3'	+ 18° 4'	+ 24° 27'	
Mag. =	1.2	5	5	6	5.4	6	
	δ Cancri.	γ Cancri.	δ Cancri.	ϵ^3 Cancri.	α Cancri.	κ Cancri.	
	δ 23°	δ 35°	δ 36°	δ 47°	δ 50°	δ 0°	
26	42.93	17.23	49.80	22.71	55.71	15.80	+.006
53	42.98	17.32	49.90	22.84	55.83	15.94	-.003
81	42.71	17.06	49.65	22.59	55.62	15.75	.012
108	42.29	16.64	49.24	22.16	55.24	15.39	.015
135	41.91	16.25	48.85	21.73	54.87	15.02	.012
162	41.70	16.02	48.62	21.46	54.63	14.77	-.006
244	42.46	16.70	49.29	22.08	55.17	15.94	+.021
272	43.14	17.38	49.94	22.76	55.77	15.82	.027
299	43.97	18.20	50.76	23.61	56.53	16.58	.032
327	44.89	19.15	51.69	24.60	57.45	17.50	.032
354	45.70	20.00	52.53	25.51	58.28	18.32	+.030
Dec. =	+ 18° 34'	+ 21° 59'	+ 18° 40'	+ 28° 27'	+ 19° 24'	+ 11° 14'	
Mag. =	6	4.5	4	6	4	5	

MOON-CULMINATING STARS. 323

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ξ Cancri.	δ Cancri.	λ Leonis.	ξ Leonis.	\circ Leonis.	\circ Leonis.	
	$9^h 1^m$	$9^h 11^m$	$9^h 23^m$	$9^h 24^m$	$9^h 33^m$	$9^h 39^m$	
d	"	"	"	"	"	"	
27	24.63	15.93	50.03	29.84	46.65	1.35	+ .006
54	24.85	16.10	50.25	30.04	46.87	1.60	+ .001
81	24.66	15.93	50.10	29.91	46.77	1.49	— .009
109	24.25	15.55	49.73	29.56	46.44	1.14	.013
136	23.85	15.17	49.33	29.20	46.08	0.74	.012
163	23.59	14.91	49.04	28.93	45.81	0.44	— .007
191	23.54	14.83	48.93	28.83	45.70	0.30	+ .001
273	24.73	15.91	49.95	29.78	46.57	1.20	.024
300	25.53	16.68	50.72	30.51	47.28	1.95	.030
327	26.45	17.58	51.64	31.37	48.15	2.86	.033
355	27.37	18.48	52.59	32.28	49.11	3.83	+ .034
Dec. = + 22° 36'		+ 18° 18'	+ 23° 35'	+ 11° 55'	+ 11° 31'	+ 24° 25'	
Mag. = 5.6		6	5.4	6	4.3	3	
	ν Leonis.	η Leonis.	α Leonis.	γ^1 Leonis.	45 Leonis.	ρ Leonis.	
	$9^h 50^m$	$9^h 59^m$	$10^h 1^m$	$10^h 12^m$	$10^h 20^m$	$10^h 25^m$	
	"	"	"	"	"	"	
27	47.99	47.87	0.84	20.90	20.96	32.03	+ .011
55	47.57	48.18	1.15	21.34	21.34	32.41	+ .005
82	47.49	48.13	1.09	21.32	21.34	32.42	— .006
110	47.19	47.83	0.81	21.03	21.10	32.19	.012
137	46.84	47.47	0.46	20.68	20.78	31.87	.012
164	46.56	47.18	0.18	20.37	20.49	31.58	.008
191	46.42	47.02	0.02	20.19	20.31	31.40	— .003
274	47.90	47.74	0.71	20.82	20.85	31.89	+ .022
301	47.88	48.42	1.38	21.48	21.48	32.51	.028
323	48.74	49.29	2.23	22.35	22.30	33.34	.032
356	49.66	50.23	3.15	23.31	23.23	34.26	+ .034
Dec. = + 13° 6'		+ 17° 26'	+ 12° 39'	+ 20° 33'	+ 10° 29'	+ 10° 1'	
Mag. = 5		3.4	1.2	2	6	4	
	37 Sextantis.	ι Leonis.	ϵ Leonis.	χ Leonis.	π Leonis.	σ Leonis.	
	$10^h 36^m$	$10^h 41^m$	$10^h 53^m$	$10^h 57^m$	$11^h 8^m$	$11^h 13^m$	
	"	"	"	"	"	"	
1	53.26	58.67	34.36	52.55	37.17	59.70	+ .029
28	53.95	59.38	35.07	53.28	37.93	60.45	.022
56	54.34	59.78	35.50	53.72	38.42	60.94	+ .009
83	54.37	59.91	35.58	53.80	38.54	61.07	— .002
111	54.17	59.63	35.41	53.64	38.39	60.95	.008
138	53.87	59.32	35.13	53.36	38.11	60.69	.011
165	53.58	59.03	34.84	53.07	37.82	60.41	.010
192	53.39	58.83	34.63	52.85	37.58	60.18	— .006
220	53.32	58.76	34.53	52.74	37.45	60.04	.000
329	55.21	60.64	36.30	54.46	39.09	61.61	+ .032
357	56.13	61.56	37.21	55.39	40.02	62.55	+ .032
Dec. = + 7° 6'		+ 11° 17'	+ 6° 51'	+ 8° 5'	+ 14° 4'	+ 6° 47'	
Mag. = 6		5	5	5	6	4	
	ϵ Leonis.	τ Leonis.	ν Virginis.	β Virginis.	π Virginis.	\circ Virginis.	
	$11^h 16^m$	$11^h 20^m$	$11^h 38^m$	$11^h 43^m$	$11^h 53^m$	$11^h 58^m$	
	"	"	"	"	"	"	
2	42.34	49.04	44.46	28.80	46.47	9.21	+ .030
29	43.10	49.78	45.25	29.58	47.28	10.00	.024
56	43.57	50.26	45.77	30.11	47.83	10.58	.013
84	43.71	50.41	45.97	30.33	48.08	10.85	+ .002
111	43.59	50.30	45.91	30.28	48.05	10.82	— .005
139	43.32	50.06	45.68	30.08	47.85	10.63	.009
166	43.03	49.78	45.41	29.82	47.59	10.37	.010
193	42.80	49.55	45.17	29.58	47.33	10.10	.008
221	42.66	49.41	44.99	29.40	47.13	9.89	— .003
330	44.25	50.95	46.37	30.74	48.36	11.08	+ .029
357	45.16	51.84	47.26	31.63	49.24	11.96	+ .031
Dec. = + 11° 18'		+ 3° 37'	+ 7° 19'	+ 2° 33'	+ 7° 23'	+ 9° 30'	
Mag. = 4		5	4.5	3.4	4.5	4	

324 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	Piazzi xii. 6.	13 Virginis.	γ Virginis.	c Virginis.	q Virginis.	γ Virginis.	
	12 ^h 4 ^m	12 ^h 11 ^m	12 ^h 12 ^m	12 ^h 13 ^m	12 ^h 26 ^m	12 ^h 34 ^m	
d							
3	34.61	34.09	48.89	18.82	37.74	38.32	+ .032
30	35.42	34.90	49.71	19.64	38.57	39.16	.027
57	35.98	35.48	50.29	20.22	39.19	39.78	.017
85	36.24	35.76	50.57	20.51	39.52	40.13	+ .006
112	36.24	35.78	50.60	20.53	39.58	40.21	— .002
140	36.06	35.62	50.44	20.36	39.46	40.09	.007
167	35.81	35.38	50.20	20.12	39.23	39.87	.010
194	35.55	35.13	49.94	19.86	38.97	39.61	.009
221	35.34	34.91	49.73	19.63	38.72	39.35	— .006
331	36.50	36.00	50.80	20.70	39.69	40.22	+ .027
358	37.36	36.87	51.66	21.56	40.56	41.07	+ .032
Dec. =	+ 4° 50'	— 0° 1'	+ 0° 6'	+ 4° 5'	— 8° 41'	— 0° 41'	
Mag. =	6.7	6	3.4	5	6	3.2	
	38 Virginis.	ψ Virginis.	δ Virginis.	δ Virginis.	α Virginis.	ζ Virginis.	
	12 ^h 46 ^m	12 ^h 47 ^m	12 ^h 48 ^m	13 ^h 2 ^m	13 ^h 17 ^m	13 ^h 27 ^m	
d							
4	5.52	8.96	37.35	46.43	53.40	37.78	+ .033
31	6.37	9.89	38.20	47.30	54.25	38.66	.029
58	7.00	10.45	38.83	47.96	54.99	39.26	.020
86	7.37	10.83	39.21	48.39	55.46	39.84	.010
113	7.47	10.95	39.32	48.54	55.65	40.05	+ .002
140	7.39	10.87	39.24	48.49	55.65	40.06	— .004
168	7.18	10.66	39.02	48.30	55.48	39.90	.009
195	6.91	10.40	38.75	48.04	55.22	39.65	.010
222	6.65	10.13	38.48	47.76	54.93	39.35	— .007
332	7.45	10.95	39.25	48.42	55.46	39.74	+ .026
359	8.32	11.82	40.11	49.27	56.30	40.56	+ .032
Dec. =	— 2° 49'	— 8° 47'	+ 4° 9'	— 4° 48'	— 10° 26'	+ 0° 7'	
Mag. =	6	5	3	4.5	1	3.4	
	π Virginis.	86 Virginis.	89 Virginis.	94 Virginis.	κ Virginis.	λ Virginis.	
	13 ^h 34 ^m	13 ^h 38 ^m	13 ^h 42 ^m	13 ^h 58 ^m	14 ^h 5 ^m	14 ^h 11 ^m	
d							
4	20.11	33.01	19.29	57.10	29.94	36.37	+ .033
32	21.03	33.95	20.24	58.03	30.88	37.27	.031
59	21.75	34.68	21.00	58.78	31.64	38.10	.025
86	22.24	35.18	21.52	59.32	32.20	38.68	.015
114	22.48	35.44	21.80	59.64	32.54	39.03	+ .006
141	22.51	35.48	21.85	59.73	32.64	39.16	.000
169	22.37	35.35	21.72	59.63	32.56	39.10	— .007
196	22.12	35.10	21.47	59.39	32.34	38.88	.011
223	21.81	34.78	21.14	59.08	32.01	38.55	.012
250	21.54	34.50	20.84	58.77	31.70	38.22	— .008
360	23.04	35.99	22.34	60.05	32.92	39.41	+ .031
Dec. =	— 8° 0'	— 11° 44'	— 17° 26'	— 8° 14'	— 9° 38'	— 12° 44'	
Mag. =	6	6	5	6	4.5	5.4	
	μ Virginis.	5 Libræ.	μ Libræ.	α Libræ.	ξ Libræ.	20 Libræ.	
	14 ^h 35 ^m	14 ^h 38 ^m	14 ^h 41 ^m	14 ^h 43 ^m	14 ^h 49 ^m	14 ^h 55 ^m	
d							
5	44.91	18.80	42.93	12.24	14.36	55.18	+ .033
33	45.83	19.75	43.87	13.19	15.29	56.18	.032
60	46.62	20.57	44.69	14.01	16.10	57.06	.028
87	47.23	21.20	45.33	14.67	16.75	57.73	.020
115	47.63	21.63	45.76	15.11	17.20	58.28	.012
142	47.80	21.82	45.96	15.31	17.42	58.54	+ .004
169	47.78	21.81	45.96	15.31	17.43	58.57	— .003
197	47.57	21.60	45.76	15.11	17.23	58.38	.010
224	47.24	21.27	45.42	14.77	16.91	58.02	.013
251	46.89	20.91	45.06	14.41	16.54	57.69	— .009
361	47.86	21.91	46.02	15.37	17.42	58.51	+ .020
Dec. =	— 5° 3'	— 14° 52'	— 13° 34'	— 15° 29'	— 10° 51'	— 24° 44'	
Mag. =	4	6	6	2.3	6	3.4	

MOON-CULMINATING STARS. 325

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ϵ^1 Libræ.	ζ^1 Libræ.	γ Libræ.	π Libræ.	η Libræ.	λ Libræ.	
	$15^{\circ} 4'$	$15^{\circ} 20'$	$15^{\circ} 27'$	$15^{\circ} 33'$	$15^{\circ} 36'$	$15^{\circ} 45'$	
d	ϵ	ζ	γ	π	η	λ	
6	18.75	25.69	45.53	56.98	16.02	16.53	+ .033
33	19.68	26.60	46.42	57.89	16.91	17.43	.032
60	20.54	27.46	47.28	58.78	17.78	18.32	.030
88	21.26	28.20	48.04	59.56	18.54	19.12	.024
115	21.75	28.72	48.56	60.12	19.10	19.71	.016
143	22.03	29.04	48.89	60.48	19.46	20.11	+ .008
170	22.07	29.12	48.99	60.60	19.58	20.27	— .001
197	21.90	28.98	48.85	60.47	19.46	20.15	.009
225	21.55	28.64	48.59	60.14	19.13	19.82	.014
252	21.16	28.24	48.12	59.73	18.73	19.40	— .013
362	21.97	28.88	48.69	60.26	19.22	19.83	+ .028
Dec. =	$-19^{\circ} 16'$	$-16^{\circ} 14'$	$-14^{\circ} 19'$	$-19^{\circ} 13'$	$-15^{\circ} 14'$	$-19^{\circ} 45'$	
Mag. =	5.4	4	4.5	5	6	6	
	ϵ Scorpii.	δ Scorpii.	ρ^1 Scorpii.	σ Scorpii.	α Scorpii.	τ Scorpii.	
	$15^{\circ} 48'$	$15^{\circ} 52'$	$15^{\circ} 57'$	$16^{\circ} 12'$	$16^{\circ} 20'$	$16^{\circ} 27'$	
d	ϵ	δ	ρ	σ	α	τ	
7	18.99	7.46	21.75	44.88	53.57	14.35	+ .033
34	19.95	8.37	22.64	45.78	54.48	15.26	.034
61	20.91	9.28	23.54	46.71	55.43	16.21	.033
88	21.73	10.06	24.31	47.55	56.36	17.06	.028
116	22.40	10.71	24.96	48.35	57.00	17.83	.021
143	22.81	11.11	25.36	48.72	57.49	18.35	.013
171	22.97	11.28	25.54	48.95	57.78	18.62	+ .002
198	22.96	11.18	25.45	48.89	57.70	18.60	— .007
225	22.51	10.86	25.14	48.58	57.40	18.30	.013
252	22.05	10.43	24.72	48.14	56.95	17.85	— .012
362	22.49	10.81	25.04	48.33	57.07	17.91	+ .014
Dec. =	$-28^{\circ} 48'$	$-22^{\circ} 13'$	$-19^{\circ} 25'$	$-25^{\circ} 15'$	$-26^{\circ} 7'$	$-27^{\circ} 55'$	
Mag. =	5.4	2.3	2	3.4	1.2	3.4	
	σ Ophiuchi.	ν Ophiuchi.	μ Ophiuchi.	λ Ophiuchi.	ξ Ophiuchi.	δ Ophiuchi.	
	$16^{\circ} 33'$	$16^{\circ} 49'$	$17^{\circ} 2'$	$17^{\circ} 6'$	$17^{\circ} 12'$	$17^{\circ} 13'$	
d	σ	ν	μ	λ	ξ	δ	
35	33.19	9.67	25.38	49.23	41.32	29.41	+ .033
62	34.08	10.52	26.24	50.15	42.26	30.32	.032
89	34.88	13.31	27.06	51.04	43.11	31.20	.029
117	35.59	12.00	27.81	51.85	43.91	32.02	.024
144	36.07	12.49	28.36	52.46	44.51	32.64	.017
171	36.33	12.75	28.69	52.82	44.87	33.02	+ .007
199	36.32	12.75	28.74	52.89	44.96	33.10	— .004
226	36.04	12.50	28.50	52.64	44.74	32.88	.012
253	35.61	12.08	28.09	52.19	44.31	32.44	.016
281	35.18	11.65	27.63	51.70	43.84	31.94	— .014
363	35.65	12.03	27.88	51.94	44.03	32.14	+ .012
Dec. =	$-17^{\circ} 28'$	$-10^{\circ} 32'$	$-15^{\circ} 33'$	$-26^{\circ} 23'$	$-20^{\circ} 58'$	$-24^{\circ} 51'$	
Mag. =	5	5	2.3	5	5	3.4	
	δ Ophiuchi.	ϵ^2 Ophiuchi.	σ Serpentis.	ϵ Sagittarii.	θ Sagittarii.	γ Sagittarii.	
	$17^{\circ} 17'$	$17^{\circ} 22'$	$17^{\circ} 33'$	$17^{\circ} 51'$	$17^{\circ} 55'$	$17^{\circ} 56'$	
d	δ	ϵ	σ	ϵ	θ	γ	
35	53.88	57.18	36.94	19.21	21.71	53.63	+ .032
63	54.82	58.11	37.80	20.10	22.60	54.57	.033
90	55.70	58.99	38.63	20.99	23.49	55.51	.034
117	56.48	59.78	39.38	21.82	24.33	56.40	.029
145	57.12	60.43	39.96	22.52	25.05	57.16	.020
172	57.50	60.83	40.39	23.00	25.53	57.67	+ .011
200	57.58	60.92	40.50	23.16	25.74	57.86	— .001
227	57.36	60.71	40.31	23.01	25.61	57.70	.011
254	56.92	60.28	39.91	22.60	25.15	57.27	.017
281	56.45	59.80	39.45	22.11	24.65	56.75	— .015
364	56.63	59.94	39.49	22.04	24.67	56.64	+ .014
Dec. =	$-24^{\circ} 3'$	$-23^{\circ} 51'$	$-12^{\circ} 48'$	$-23^{\circ} 48'$	$-24^{\circ} 28'$	$-30^{\circ} 25'$	
Mag. =	5	5	5.4	5	5.4	3.4	

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Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	μ^1 Sagittarii.	δ Sagittarii.	λ Sagittarii.	Bradley 2333.	ϕ Sagittarii.	29 Sagittarii.	
	$18^h 5^m$	$18^h 12^m$	$18^h 19^m$	$18^h 30^m$	$18^h 36^m$	$18^h 41^m$	
d	μ	δ	λ	ϕ	ϕ	ϕ	
36	27.67	6.32	24.12	3.90	58.98	25.66	+ .027
63	28.50	7.20	24.96	4.71	59.80	26.43	.031
91	29.40	8.17	25.89	5.62	60.74	27.32	.033
118	30.23	9.06	26.75	6.48	61.67	28.16	.029
146	30.95	9.85	27.53	7.27	62.44	28.95	.024
173	31.43	10.39	28.06	7.82	63.03	29.52	.014
200	31.62	10.60	28.29	8.07	63.32	29.80	+ .003
228	31.48	10.47	28.19	7.98	63.24	29.74	— .009
255	31.09	10.05	27.78	7.61	62.87	29.39	.016
282	30.61	9.54	27.29	7.13	62.38	28.92	.017
364	30.48	9.34	27.06	6.84	62.02	28.56	— .009
Dec. =	$-21^{\circ} 6'$	$-29^{\circ} 53'$	$-25^{\circ} 30'$	$-23^{\circ} 37'$	$-27^{\circ} 8'$	$-20^{\circ} 29'$	
Mag. =	4	3.4	3	5	4.3	6	
	ν^1 Sagittarii.	σ Sagittarii.	ζ Sagittarii.	τ Sagittarii.	χ^1 Sagittarii.	λ^2 Sagittarii.	
	$18^h 45^m$	$18^h 46^m$	$18^h 53^m$	$18^h 58^m$	$19^h 16^m$	$19^h 28^m$	
64	47.98	40.19	47.54	17.00	49.92	15.90	+ .031
92	48.83	41.11	48.49	17.93	50.80	16.78	.033
119	49.70	42.00	49.41	18.84	51.69	17.67	.032
146	50.47	42.80	50.24	19.66	52.52	18.51	.026
174	51.07	43.42	50.90	20.32	53.21	19.22	.018
201	51.36	43.71	51.22	20.65	53.57	19.62	+ .006
228	51.30	43.66	51.18	20.62	53.60	19.67	— .006
256	50.94	43.29	50.81	20.26	53.28	19.38	.015
283	50.46	42.80	50.30	19.77	52.81	18.92	.017
310	50.05	42.37	49.85	19.32	52.37	18.47	.012
365	50.09	42.41	49.85	19.30	52.26	18.30	— .000
Dec. =	$-22^{\circ} 55'$	$-26^{\circ} 28'$	$-30^{\circ} 5'$	$-27^{\circ} 52'$	$-24^{\circ} 46'$	$-25^{\circ} 11'$	
Mag. =	5	2.3	3.4	4.3	6	5.4	
	ϵ^2 Sagittarii.	f Sagittarii.	b Sagittarii.	A Sagittarii.	c Sagittarii.	Piazzi xix.366.	
	$19^h 33^m$	$19^h 38^m$	$19^h 48^m$	$19^h 50^m$	$19^h 54^m$	$19^h 55^m$	
65	35.08	16.12	25.92	29.88	7.44	32.00	+ .025
92	35.87	16.92	26.76	30.71	8.27	32.86	.031
119	36.72	17.79	27.66	31.61	9.18	33.81	.033
147	37.56	18.65	28.58	32.53	10.11	34.78	.030
174	38.21	19.32	29.31	33.26	10.85	35.56	.022
202	38.61	19.75	29.78	33.72	11.34	36.06	+ .010
229	38.65	19.80	29.87	33.82	11.45	36.18	— .003
256	38.40	19.55	29.62	33.58	11.20	35.93	.013
283	37.97	19.11	29.16	33.13	10.75	35.46	.017
311	37.53	18.66	28.68	32.64	10.26	34.94	.014
338	37.31	18.42	28.41	32.37	9.98	34.64	— .006
Dec. =	$-16^{\circ} 27'$	$-20^{\circ} 5'$	$-27^{\circ} 32'$	$-26^{\circ} 34'$	$-28^{\circ} 6'$	$-32^{\circ} 27'$	
Mag. =	5	5	5	5	5	5	
	α^2 Capricorni.	π Capricorni.	ρ Capricorni.	ν Capricorni.	ψ Capricorni.	ω Capricorni.	
	$20^h 10^m$	$20^h 19^m$	$20^h 20^m$	$20^h 32^m$	$20^h 37^m$	$20^h 43^m$	
66	21.19	22.59	56.60	8.87	52.56	31.04	+ .024
93	21.92	23.33	57.34	9.59	53.30	31.78	.029
120	22.76	24.18	58.18	10.43	54.18	32.66	.031
148	23.61	25.06	59.06	11.32	55.11	33.60	.030
175	24.31	25.80	59.81	12.08	55.92	34.43	.024
202	24.77	26.30	60.28	12.60	56.48	35.01	+ .013
230	24.90	26.46	60.47	12.79	56.70	35.25	.000
257	24.71	26.28	60.30	12.65	56.56	35.11	— .010
284	24.32	25.89	59.91	12.27	56.17	34.73	.015
312	23.88	25.44	59.45	11.82	55.69	34.24	.014
339	23.61	25.15	59.17	11.52	55.36	33.90	— .010
Dec. =	$-12^{\circ} 58'$	$-18^{\circ} 40'$	$-18^{\circ} 16'$	$-18^{\circ} 37'$	$-25^{\circ} 46'$	$-27^{\circ} 26'$	
Mag. =	3.4	5	5	6.5	4.5	4.5	

MOON-CULMINATING STARS. 327

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ν Aquarii.	ι Capricorni.	ζ Capricorni.	ϵ Capricorni.	γ Capricorni.	δ Capricorni.	
	21 ^h 2 ^m	21 ^h 14 ^m	21 ^h 18 ^m	21 ^h 29 ^m	21 ^h 32 ^m	21 ^h 39 ^m	
d	^s	^s	^s	^s	^s	^s	
67	1.82	31.04	44.27	18.32	23.92	22.49	+ .016
94	2.47	31.68	44.91	18.93	24.51	23.07	.026
121	3.96	32.47	45.73	19.72	25.29	23.83	.030
149	4.14	33.38	46.66	20.64	26.20	24.74	.031
176	4.91	34.18	47.49	21.46	27.01	25.56	.027
203	5.47	34.79	48.13	22.11	27.65	26.22	.017
231	5.72	35.08	48.44	22.45	27.99	26.58	+ .005
258	5.63	35.02	48.39	22.43	27.99	26.59	— .006
285	5.31	34.71	48.08	22.14	27.71	26.33	.013
313	4.89	34.28	47.63	21.72	27.30	25.92	.014
340	4.58	33.95	47.28	21.37	26.96	25.58	— .013
Dec. =	— 11° 56'	— 17° 25'	— 23° 1'	— 20° 5'	— 17° 17'	— 16° 45'	
Mag. =	4.5	4.5	4	5.4	4.3	3	
	μ Capricorni.	ϵ Aquarii.	δ Aquarii.	η Aquarii.	53 ^a Aquarii.	σ Aquarii.	
	21 ^h 45 ^m	21 ^h 58 ^m	22 ^h 9 ^m	22 ^h 12 ^m	22 ^h 19 ^m	22 ^h 23 ^m	
	^s	^s	^s	^s	^s	^s	
13	43.03	55.83	30.03	53.19	1.78	16.59	+ .005
95	44.05	56.74	30.84	53.97	2.54	17.29	.023
122	44.81	57.48	31.55	54.67	3.25	17.98	.029
150	45.71	58.37	32.42	55.54	4.14	18.85	.031
177	46.52	59.20	33.25	56.36	5.00	19.69	.028
204	47.17	59.87	33.92	57.04	5.71	20.39	.020
232	47.53	60.26	34.33	57.46	6.16	20.84	+ .009
259	47.55	60.31	34.41	57.54	6.26	20.96	— .002
286	47.29	60.08	34.21	57.36	6.08	20.78	.010
314	46.91	59.71	33.86	57.01	5.72	20.45	.013
341	46.57	59.37	33.53	56.68	5.37	20.12	— .010
Dec. =	— 14° 12'	— 14° 33'	— 8° 28'	— 8° 31'	— 17° 27'	— 11° 23'	
Mag. =	5	4	4.5	5.6	6	5.4	
	π Aquarii.	τ^2 Aquarii.	δ Aquarii.	η Aquarii.	ψ^1 Aquarii.	ψ^2 Aquarii.	
	22 ^h 30 ^m	22 ^h 42 ^m	22 ^h 47 ^m	23 ^h 7 ^m	23 ^h 8 ^m	23 ^h 11 ^m	
	^s	^s	^s	^s	^s	^s	
14	33.73	14.11	16.57	7.86	36.84	44.22	— .007
96	34.39	14.69	17.12	8.23	37.21	44.56	+ .015
123	35.06	15.35	17.78	8.84	37.82	45.16	.027
151	35.92	16.22	18.64	9.66	38.65	45.99	.031
178	36.76	17.08	19.52	10.52	39.51	46.84	.030
205	37.44	17.81	20.26	11.27	40.27	47.60	.023
233	37.89	18.29	20.76	11.79	40.81	48.15	.012
260	38.00	18.44	20.88	12.01	41.03	48.38	+ .002
287	37.85	18.31	20.80	11.96	40.97	48.33	— .007
315	37.53	17.90	20.49	11.69	40.71	48.07	.011
342	37.21	17.66	20.15	11.39	40.41	47.76	— .013
Dec. =	— 4° 57'	— 14° 19'	— 16° 34'	— 6° 48'	— 9° 51'	— 10° 22'	
Mag. =	5	4	3	4.5	5.4	5	
	π Piscium.	λ Piscium.	η Piscium.	ζ Piscium.	σ Piscium.	β Piscium.	
	23 ^h 19 ^m	23 ^h 34 ^m	23 ^h 40 ^m	23 ^h 51 ^m	23 ^h 54 ^m	23 ^h 58 ^m	
	^s	^s	^s	^s	^s	^s	
15	48.93	57.96	48.29	33.97	50.59	13.98	— .010
43	48.82	57.83	48.13	33.80	50.41	13.79	— .003
125	49.86	58.75	49.00	34.59	51.17	14.52	+ .025
152	50.65	59.53	49.77	35.34	51.92	15.27	.031
179	51.50	60.38	50.66	36.19	52.77	16.12	.031
207	52.28	61.17	51.43	37.01	53.60	16.95	.025
234	52.80	61.73	52.00	37.60	54.19	17.55	.016
261	53.03	61.99	52.28	37.91	54.52	17.89	+ .006
288	53.00	62.00	52.30	37.96	54.57	17.95	— .003
316	52.77	61.80	52.12	37.79	54.41	17.80	.009
343	52.47	61.52	51.83	37.53	54.14	17.53	— .012
Dec. =	+ 0° 30'	+ 1° 1'	— 3° 32'	— 4° 20'	— 6° 47'	— 6° 29'	
Mag. =	5.4	5	6	5.6	5	5	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

JANUARY.						FEBRUARY.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly DIF.	Meridian Transit.	Hourly DIF.	Semi-diameter.	Horizontal Parallax.	Hourly DIF.	Meridian Transit.	Hourly DIF.	
d				h m	m	d			h m	m	
1.0	16 9.7	59 12.4	+0.26	L. 4 3.7	2.02	16 9.8	59 12.8	-1.13	L. 5 22.7	2.26	
1.5	16 10.3	59 14.8	0.14	U. 16 27.9	2.02	16 6.1	58 58.9	1.18	U. 17 59.1	2.30	
2.0	16 10.6	59 15.7	+0.02	L. 4 52.2	2.03	16 2.1	58 44.3	1.23	L. 6 18.1	2.35	
2.5	16 10.5	59 15.4	-0.08	U. 17 16.7	2.05	15 58.0	58 29.2	1.27	U. 18 46.6	2.39	
3.0	16 10.2	59 13.9	0.17	L. 5 41.5	2.06	15 53.8	58 13.9	1.28	L. 7 15.4	2.41	
3.5	16 9.4	59 11.3	0.26	U. 18 6.8	2.13	15 49.6	57 58.5	1.28	U. 19 44.4	2.42	
4.0	16 8.4	59 7.6	0.35	L. 6 32.6	2.18	15 45.5	57 43.1	1.28	L. 8 13.4	2.41	
4.5	16 7.2	59 2.9	0.43	U. 18 59.1	2.24	15 41.3	57 27.8	1.28	U. 20 42.2	2.38	
5.0	16 5.6	58 57.2	0.52	L. 7 26.3	2.29	15 37.1	57 12.5	1.27	L. 9 10.5	2.33	
5.5	16 3.7	58 50.5	0.60	U. 19 54.2	2.34	15 33.0	56 57.4	1.25	U. 21 38.2	2.27	
6.0	16 1.6	58 42.7	0.69	L. 8 22.7	2.39	15 28.9	56 42.5	1.24	L. 10 5.1	2.20	
6.5	15 59.2	58 33.9	0.78	U. 20 51.7	2.43	15 24.9	56 27.7	1.23	U. 22 31.0	2.12	
7.0	15 56.5	58 23.9	0.88	L. 9 21.1	2.46	15 20.9	56 13.1	1.21	L. 10 56.1	2.05	
7.5	15 53.4	58 12.7	0.97	U. 21 50.7	2.47	15 17.0	55 58.8	1.18	U. 23 20.3	1.98	
8.0	15 50.1	58 0.4	1.07	L. 10 20.2	2.45	15 13.2	55 44.8	1.15	L. 11 43.7	1.91	
8.5	15 46.5	57 47.0	1.16	U. 22 49.3	2.41	15 9.5	55 31.2	1.12			
9.0	15 42.5	57 32.6	1.23	L. 11 17.8	2.35	15 5.9	55 18.1	1.07	U. 0 6.2	1.85	
9.5	15 38.4	57 17.3	1.30	U. 23 45.5	2.27	15 2.5	55 5.6	1.02	L. 12 28.1	1.80	
10.0	15 34.0	57 1.3	1.36			14 59.3	54 53.7	0.96	U. 0 49.4	1.75	
10.5	15 29.5	56 44.7	1.40	L. 12 12.2	2.19	14 56.3	54 42.7	0.88	L. 13 10.1	1.71	
11.0	15 24.9	56 27.6	1.42	U. 0 38.0	2.11	14 53.6	54 32.8	0.78	U. 1 30.5	1.69	
11.5	15 20.2	56 10.5	1.42	L. 13 2.8	2.02	14 51.2	54 24.1	0.67	L. 13 50.8	1.69	
12.0	15 15.5	55 53.5	1.40	U. 1 26.6	1.94	14 49.2	54 16.8	0.55	U. 2 11.1	1.68	
12.5	15 11.0	55 36.9	1.36	L. 13 49.4	1.87	14 47.6	54 10.9	0.42	L. 14 31.3	1.68	
13.0	15 6.7	55 20.9	1.29	U. 2 11.5	1.82	14 46.5	54 6.7	0.27	U. 2 51.5	1.69	
13.5	15 2.6	55 6.0	1.18	L. 14 33.0	1.77	14 45.9	54 4.5	-0.10	L. 15 11.9	1.72	
14.0	14 59.0	54 52.5	1.07	U. 2 53.9	1.73	14 45.9	54 4.4	+0.06	U. 3 32.7	1.75	
14.5	14 55.7	54 40.5	0.93	L. 15 14.4	1.70	14 46.5	54 6.5	0.27	L. 15 54.0	1.80	
15.0	14 52.9	54 30.2	0.77	U. 3 34.6	1.68	14 47.7	54 11.0	0.47	U. 4 15.9	1.85	
15.5	14 50.7	54 22.0	0.59	L. 15 54.7	1.67	14 49.5	54 17.9	0.68	L. 16 38.4	1.90	
16.0	14 49.0	54 16.0	0.41	U. 4 14.7	1.67	14 52.1	54 27.3	0.88	U. 5 1.6	1.96	
16.5	14 48.0	54 12.3	-0.21	L. 16 34.9	1.69	14 55.3	54 39.2	1.09	L. 17 25.6	2.03	
17.0	14 47.7	54 11.1	0.00	U. 4 55.3	1.71	14 59.3	54 53.6	1.30	U. 5 50.3	2.09	
17.5	14 48.1	54 12.5	+0.22	L. 17 16.0	1.75	15 3.9	55 10.5	1.51	L. 18 15.8	2.15	
18.0	14 49.2	54 16.5	0.44	U. 5 37.3	1.80	15 9.1	55 29.8	1.70	U. 6 42.0	2.21	
18.5	14 51.0	54 23.2	0.67	L. 17 59.2	1.86	15 15.0	55 51.3	1.88	L. 19 8.8	2.25	
19.0	14 53.5	54 32.5	0.88	U. 6 21.8	1.92	15 21.4	56 15.0	2.04	U. 7 36.1	2.29	
19.5	14 56.8	54 44.4	1.09	L. 18 45.2	1.98	15 28.3	56 40.4	2.17	L. 20 3.8	2.32	
20.0	15 0.6	54 58.7	1.29	U. 7 9.4	2.05	15 35.6	57 7.1	2.27	U. 8 31.8	2.33	
20.5	15 5.2	55 15.4	1.47	L. 19 34.5	2.13	15 43.2	57 34.9	2.33	L. 20 59.9	2.33	
21.0	15 10.3	55 34.2	1.64	U. 8 0.5	2.20	15 50.9	58 3.2	2.34	U. 9 27.8	2.32	
21.5	15 15.9	55 54.8	1.78	L. 20 27.3	2.26	15 58.5	58 31.1	2.30	L. 21 55.5	2.30	
22.0	15 22.0	56 17.1	1.90	U. 8 54.8	2.31	16 5.9	58 58.3	2.21	U. 10 22.9	2.27	
22.5	15 28.4	56 40.5	1.98	L. 21 22.8	2.35	16 12.9	59 24.1	2.07	L. 22 49.9	2.24	
23.0	15 35.0	57 4.6	2.02	U. 9 51.2	2.37	16 19.4	59 47.8	1.87	U. 11 16.6	2.21	
23.5	15 41.6	57 29.0	2.02	L. 22 19.8	2.38	16 25.1	60 8.8	1.62	L. 23 43.1	2.19	
24.0	15 48.1	57 53.1	1.98	U. 10 48.4	2.37	16 29.9	60 26.6	1.32			
24.5	15 54.5	58 16.5	1.90	L. 23 16.8	2.35	16 33.7	60 40.5	0.98	U. 12 9.3	2.18	
25.0	16 0.5	58 38.6	1.77	U. 11 44.7	2.31	16 36.4	60 50.2	0.63	L. 0 35.3	2.17	
25.5	16 6.1	58 58.9	1.60			16 37.8	60 55.6	+0.26	U. 13 1.4	2.17	
26.0	16 11.0	59 17.0	1.39	L. 0 12.1	2.26	16 38.0	60 56.4	-0.12	L. 1 27.5	2.18	
26.5	16 15.2	59 32.5	1.17	U. 12 39.1	2.22	16 37.1	60 52.8	0.47	U. 13 53.8	2.20	
27.0	16 18.7	59 45.2	0.93	L. 1 5.4	2.18	16 35.0	60 45.1	0.79	L. 2 20.4	2.24	
27.5	16 21.3	59 54.8	0.67	U. 13 31.4	2.15	16 31.9	60 33.8	1.07	U. 14 47.5	2.28	
28.0	16 23.0	60 1.1	0.39	L. 1 57.0	2.12	16 27.9	60 19.2	1.33	L. 3 15.1	2.32	
28.5	16 23.8	60 4.1	+0.13	U. 14 22.3	2.10	16 23.2	60 1.8	1.53	U. 15 43.2	2.36	
29.0	16 23.8	60 4.0	-0.12	L. 2 47.5	2.10	16 17.9	59 42.5	1.70	L. 4 11.9	2.39	
29.5	16 23.0	60 1.0	0.36	U. 15 12.6	2.10	16 12.2	59 21.3	1.81	U. 16 40.8	2.43	
30.0	16 21.4	59 55.4	0.57	L. 3 37.8	2.11	16 6.1	58 59.2	1.87	L. 5 10.0	2.44	
30.5	16 19.2	59 47.4	0.75	U. 16 3.4	2.14	16 0.0	58 36.6	1.90	U. 17 39.5	2.45	
31.0	16 16.5	59 37.4	0.90	L. 4 29.4	2.18	15 53.9	58 13.8	1.90	L. 6 8.8	2.43	
31.5	16 13.3	59 25.7	-1.02	U. 16 55.8	2.22	15 47.7	57 51.3	-1.86	U. 18 37.9	2.41	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

MARCH.						APRIL.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Trans.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Trans.	Hourly Diff.	
d				h m	m				h m	m	
1.0	16 17.9	59 42.5	-1.70	L. 4 12.0	2.39	15 43.8	57 37.3	-2.23	L. 5 56.1	2.32	
1.5	16 12.2	59 21.3	1.81	U. 16 40.8	2.43	15 36.6	57 11.1	2.14	U. 18 23.3	2.24	
2.0	16 6.1	58 59.2	1.87	L. 5 10.0	2.44	15 29.8	56 46.1	2.03	L. 6 49.6	2.14	
2.5	16 0.0	58 36.6	1.90	U. 17 39.5	2.45	15 23.4	56 22.6	1.89	U. 19 14.7	2.05	
3.0	15 53.9	58 13.8	1.90	L. 6 8.8	2.43	15 17.5	56 0.7	1.75	L. 7 39.0	1.98	
3.5	15 47.7	57 51.3	1.86	U. 18 37.9	2.41	15 12.1	55 40.6	1.60	U. 20 2.2	1.91	
4.0	15 41.6	57 29.3	1.81	L. 7 6.5	2.36	15 7.1	55 22.3	1.45	L. 8 24.6	1.84	
4.5	15 35.8	57 8.1	1.73	U. 19 34.4	2.29	15 2.6	55 5.9	1.30	U. 20 46.3	1.79	
5.0	15 30.3	56 47.9	1.64	L. 8 1.4	2.22	14 58.6	54 51.4	1.14	L. 9 7.5	1.74	
5.5	15 25.1	56 28.7	1.55	U. 20 27.6	2.15	14 55.1	54 38.6	0.99	U. 21 28.2	1.72	
6.0	15 20.2	56 10.6	1.46	L. 8 52.9	2.08	14 52.2	54 27.6	0.84	L. 9 48.6	1.70	
6.5	15 15.7	55 53.7	1.36	U. 21 17.4	2.00	14 49.6	54 18.4	0.69	U. 22 8.7	1.68	
7.0	15 11.4	55 37.9	1.27	L. 9 40.9	1.93	14 47.5	54 10.8	0.57	L. 10 28.8	1.68	
7.5	15 7.4	55 23.3	1.17	U. 22 3.7	1.87	14 45.9	54 4.8	0.44	U. 22 48.9	1.68	
8.0	15 3.7	55 9.9	1.07	L. 10 25.8	1.83	14 44.7	54 0.3	0.32	L. 11 9.1	1.69	
8.5	15 0.4	54 57.5	0.98	U. 22 47.2	1.77	14 43.9	53 57.2	0.20	U. 23 29.6	1.71	
9.0	14 57.3	54 46.3	0.89	L. 11 8.2	1.73	14 43.4	53 55.4	-0.09	L. 11 50.4	1.74	
9.5	14 54.5	54 36.3	0.79	U. 23 28.8	1.70	14 43.3	53 54.9	+0.02			
10.0	14 52.1	54 27.3	0.70	L. 11 49.1	1.68	14 43.5	53 55.8	0.13	U. 0 11.5	1.79	
10.5	14 49.9	54 19.4	0.61			14 44.0	53 58.0	0.24	L. 12 33.3	1.83	
11.0	14 48.1	54 12.6	0.52	U. 0 9.2	1.68	14 45.0	54 1.6	0.35	U. 0 55.5	1.88	
11.5	14 46.5	54 7.0	0.43	L. 12 29.3	1.68	14 46.4	54 6.5	0.47	L. 13 18.4	1.93	
12.0	14 45.3	54 2.6	0.32	U. 0 49.6	1.69	14 48.2	54 12.9	0.59	U. 1 41.8	1.98	
12.5	14 44.5	53 59.5	0.20	L. 13 9.1	1.71	14 50.3	54 20.8	0.73	L. 14 6.0	2.04	
13.0	14 44.0	53 57.8	-0.07	U. 1 30.5	1.73	14 52.9	54 30.3	0.86	U. 2 30.7	2.08	
13.5	14 44.0	53 57.6	+0.06	L. 13 51.5	1.76	14 55.9	54 41.4	1.00	L. 14 56.0	2.13	
14.0	14 44.4	53 59.1	0.19	U. 2 12.9	1.81	14 59.4	54 54.2	1.14	U. 3 21.7	2.16	
14.5	14 45.3	54 2.4	0.34	L. 14 34.9	1.86	15 3.4	55 8.8	1.29	L. 15 47.8	2.19	
15.0	14 46.7	54 7.5	0.51	U. 2 57.6	1.91	15 7.8	55 25.1	1.43	U. 4 14.0	2.19	
15.5	14 48.6	54 14.7	0.68	L. 15 20.8	1.96	15 12.7	55 43.2	1.58	L. 16 40.4	2.20	
16.0	14 51.1	54 23.9	0.85	U. 3 44.7	2.01	15 18.1	56 3.1	1.73	U. 5 6.7	2.19	
16.5	14 54.1	54 35.3	1.04	L. 16 9.3	2.07	15 24.0	56 24.7	1.87	L. 17 33.0	2.18	
17.0	14 57.9	54 48.9	1.23	U. 4 34.4	2.12	15 30.3	56 47.9	2.00	U. 5 59.0	2.16	
17.5	15 2.3	55 4.8	1.42	L. 17 0.2	2.17	15 37.1	57 12.5	2.10	L. 18 24.8	2.14	
18.0	15 7.2	55 22.9	1.60	U. 5 26.5	2.20	15 44.1	57 38.3	2.20	U. 6 50.4	2.12	
18.5	15 12.8	55 43.2	1.79	L. 17 53.1	2.23	15 51.4	58 5.1	2.27	L. 19 15.8	2.11	
19.0	15 18.8	56 5.7	1.95	U. 6 20.0	2.25	15 58.8	58 32.4	2.29	U. 7 41.0	2.10	
19.5	15 25.5	56 30.1	2.12	L. 18 47.1	2.25	16 6.3	58 59.7	2.27	L. 20 6.0	2.09	
20.0	15 32.7	56 56.3	2.26	U. 7 14.1	2.25	16 13.5	59 26.4	2.20	U. 8 31.1	2.10	
20.5	15 40.2	57 24.0	2.36	L. 19 41.0	2.24	16 20.4	59 51.9	2.06	L. 20 56.3	2.12	
21.0	15 48.0	57 52.8	2.44	U. 8 7.8	2.22	16 26.9	60 15.5	1.88	U. 9 21.9	2.14	
21.5	15 56.0	58 22.1	2.46	L. 20 34.4	2.20	16 32.7	60 36.5	1.63	L. 21 47.9	2.19	
22.0	16 4.0	58 51.5	2.44	U. 9 0.7	2.18	16 37.5	60 54.3	1.33	U. 10 14.3	2.23	
22.5	16 12.0	59 20.3	2.37	L. 21 26.9	2.18	16 41.3	61 8.2	0.99	L. 22 41.4	2.28	
23.0	16 19.4	59 47.7	2.22	U. 9 52.9	2.17	16 44.0	61 17.7	0.60	U. 11 9.2	2.35	
23.5	16 26.2	60 13.0	2.01	L. 22 18.9	2.17	16 45.2	61 22.4	+0.18	L. 23 38.0	2.43	
24.0	16 32.4	60 35.5	1.74	U. 10 45.0	2.18	16 45.1	61 22.2	-0.23			
24.5	16 37.6	60 54.4	1.42	L. 23 11.0	2.20	16 43.8	61 16.9	0.65	U. 12 7.5	2.50	
25.0	16 41.6	61 9.2	1.05	U. 11 27.4	2.22	16 41.0	61 6.7	1.05	L. 0 37.8	2.55	
25.5	16 44.4	61 19.4	0.65			16 37.0	60 52.1	1.40	U. 13 9.0	2.61	
26.0	16 45.8	61 24.7	+0.23	L. 0 4.3	2.25	16 31.9	60 33.4	1.72	L. 1 40.4	2.63	
26.5	16 45.9	61 24.8	-0.20	U. 12 31.7	2.30	16 25.8	60 11.1	1.99	U. 14 11.9	2.62	
27.0	16 44.6	61 20.0	0.62	L. 0 59.6	2.35	16 19.0	59 46.1	2.19	L. 2 43.1	2.59	
27.5	16 42.0	61 10.3	1.01	U. 13 28.2	2.41	16 11.5	59 19.1	2.33	U. 15 14.1	2.55	
28.0	16 38.1	60 56.1	1.36	L. 1 57.5	2.46	16 3.8	58 50.6	2.41	L. 3 44.1	2.47	
28.5	16 33.2	60 38.1	1.66	U. 14 27.3	2.51	15 56.0	58 21.5	2.44	U. 16 13.2	2.37	
29.0	16 27.3	60 16.8	1.90	L. 2 57.5	2.54	15 48.0	57 52.4	2.42	L. 4 41.1	2.28	
29.5	16 20.8	59 52.8	2.10	U. 15 28.0	2.54	15 40.2	57 23.8	2.35	U. 17 7.9	2.18	
30.0	16 13.8	59 26.9	2.22	L. 3 58.5	2.54	15 32.6	56 56.2	2.26	L. 5 33.5	2.08	
30.5	16 6.3	58 59.8	2.30	U. 16 28.8	2.51	15 25.5	56 30.0	2.12	U. 17 57.9	2.00	
31.0	15 58.8	58 32.2	2.32	L. 4 58.8	2.46	15 18.8	56 5.5	1.96	L. 6 21.5	1.92	
31.5	15 51.3	58 4.5	-2.30	U. 17 27.9	2.30	15 12.6	55 42.9	-1.79	U. 18 44.0	1.85	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.										
MAY.						JUNE.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.
d	15"	56'	—1.96	h m	m	14'	54'	—0.86	h m	m
1.0	15 18.8	56 5.5	—1.96	L. 6 21.5	1.92	14 52.0	54 27.0	—0.86	L. 7 6.2	1.69
1.5	15 12.6	55 42.9	1.79	U. 18 44.0	1.85	14 49.5	54 17.9	0.65	U. 19 26.4	1.69
2.0	15 7.1	55 22.5	1.61	L. 7 5.7	1.79	14 47.7	54 11.2	0.45	L. 7 46.7	1.70
2.5	15 2.1	55 4.3	1.42	U. 19 26.9	1.74	14 46.5	54 7.0	0.25	U. 20 7.5	1.74
3.0	14 57.8	54 48.3	1.24	L. 7 48.6	1.72	14 46.0	54 5.1	—0.07	L. 8 28.6	1.77
3.5	14 54.0	54 34.6	1.05	U. 20 8.1	1.69	14 46.0	54 5.3	+0.11	U. 20 50.1	1.82
4.0	14 50.9	54 23.1	0.86	L. 8 28.1	1.68	14 46.7	54 7.6	0.27	L. 9 12.2	1.87
4.5	14 48.5	54 13.9	0.67	U. 20 48.2	1.67	14 47.8	54 11.8	0.43	U. 21 35.1	1.92
5.0	14 46.5	54 6.9	0.50	L. 9 8.2	1.67	14 49.5	54 17.8	0.57	L. 9 58.6	1.98
5.5	14 45.1	54 1.9	0.33	U. 21 28.5	1.70	14 51.6	54 25.6	0.71	U. 22 22.7	2.04
6.0	14 44.3	53 58.8	0.18	L. 9 49.1	1.73	14 54.1	54 34.8	0.82	L. 10 47.6	2.10
6.5	14 44.0	53 57.6	—0.03	U. 22 10.0	1.77	14 56.9	54 45.1	0.90	U. 23 13.1	2.15
7.0	14 44.2	53 58.2	+0.11	L. 10 31.4	1.81	15 0.0	54 56.3	0.97	L. 11 39.1	2.18
7.5	14 44.7	54 0.2	0.22	U. 22 53.4	1.86	15 3.3	55 8.5	1.05		
8.0	14 45.6	54 3.6	0.34	L. 11 16.0	1.91	15 6.8	55 21.5	1.11	U. 0 5.4	2.21
8.5	14 46.8	54 8.4	0.46	U. 23 39.2	1.96	15 10.6	55 35.1	1.16	L. 12 32.0	2.22
9.0	14 48.5	54 14.5	0.55			15 14.4	55 49.3	1.20	U. 0 58.7	2.22
9.5	14 50.5	54 21.7	0.65	L. 12 3.1	2.01	15 18.4	56 3.8	1.23	L. 13 25.2	2.21
10.0	14 52.8	54 30.1	0.75	U. 0 27.5	2.06	15 22.4	56 18.6	1.25	U. 1 51.6	2.20
10.5	14 55.4	54 39.6	0.84	L. 12 52.6	2.11	15 26.5	56 33.8	1.27	L. 14 17.7	2.17
11.0	14 58.3	54 50.2	0.93	U. 1 18.2	2.14	15 30.7	56 49.2	1.29	U. 2 43.3	2.13
11.5	15 1.5	55 1.9	1.02	L. 13 44.1	2.17	15 34.9	57 4.8	1.31	L. 15 8.5	2.08
12.0	15 5.0	55 14.7	1.11	U. 2 10.3	2.19	15 39.2	57 20.5	1.31	U. 3 33.2	2.05
12.5	15 8.7	55 28.6	1.20	L. 14 36.8	2.20	15 43.5	57 36.2	1.31	L. 15 57.6	2.02
13.0	15 12.8	55 43.5	1.29	U. 3 3.2	2.20	15 47.8	57 51.9	1.31	U. 4 21.8	2.01
13.5	15 17.2	55 59.6	1.39	L. 15 29.3	2.17	15 52.1	58 7.6	1.30	L. 16 45.8	2.00
14.0	15 21.9	56 16.8	1.48	U. 3 55.2	2.14	15 56.3	58 23.1	1.28	U. 5 9.6	1.99
14.5	15 26.8	56 35.0	1.56	L. 16 20.8	2.12	16 0.5	58 38.4	1.26	L. 17 33.6	2.00
15.0	15 32.0	56 54.2	1.65	U. 4 46.0	2.09	16 4.5	58 53.2	1.21	U. 5 57.6	2.01
15.5	15 37.5	57 14.4	1.72	L. 17 10.9	2.06	16 8.3	59 7.2	1.14	L. 18 22.1	2.04
16.0	15 43.2	57 35.4	1.78	U. 5 35.5	2.04	16 11.9	59 20.4	1.06	U. 6 47.0	2.09
16.5	15 49.1	57 57.0	1.83	L. 17 59.9	2.02	16 15.2	59 32.4	0.95	L. 19 12.6	2.16
17.0	15 55.2	58 19.0	1.85	U. 6 24.2	2.02	16 18.1	59 43.0	0.81	U. 7 39.1	2.24
17.5	16 1.2	58 41.1	1.85	L. 18 48.4	2.02	16 20.5	59 51.7	0.65	U. 20 6.6	2.32
18.0	16 7.1	59 3.1	1.81	U. 7 12.7	2.03	16 22.2	59 58.2	0.44	U. 8 34.8	2.39
18.5	16 12.9	59 24.3	1.74	L. 19 37.4	2.06	16 23.3	60 2.3	+0.22	L. 21 4.0	2.47
19.0	16 18.4	59 44.3	1.62	U. 8 2.4	2.11	16 23.7	60 3.7	—0.01	U. 9 34.1	2.52
19.5	16 23.5	60 2.8	1.46	L. 20 28.0	2.16	16 23.3	60 2.2	0.25	L. 22 4.7	2.57
20.0	16 28.0	60 19.1	1.25	U. 8 54.3	2.22	16 22.1	59 57.6	0.51	U. 10 35.7	2.60
20.5	16 31.6	60 32.5	1.00	L. 21 21.6	2.30	16 20.0	59 49.7	0.78	L. 23 7.0	2.60
21.0	16 34.4	60 42.7	0.70	U. 9 49.6	2.38	16 17.0	59 38.9	1.02	U. 11 38.2	2.58
21.5	16 36.2	60 49.2	0.38	L. 22 18.7	2.45	16 13.3	59 25.2	1.26		
22.0	16 36.8	60 51.7	+0.03	U. 10 48.6	2.53	16 8.8	59 8.7	1.48	L. 0 8.7	2.52
22.5	16 36.4	60 50.0	—0.32	L. 23 19.4	2.59	16 3.7	58 50.0	1.66	U. 12 39.5	2.45
23.0	16 34.8	60 44.1	0.68	U. 11 50.8	2.64	15 58.1	58 29.2	1.80	L. 1 7.3	2.35
23.5	16 32.0	60 33.8	1.03			15 52.0	58 6.9	1.91	U. 13 35.0	2.26
24.0	16 28.1	60 19.7	1.33	L. 0 22.6	2.66	15 45.6	57 43.7	1.98	L. 2 1.5	2.16
24.5	16 23.3	60 2.0	1.63	U. 12 54.3	2.63	15 39.2	57 19.9	2.00	U. 14 26.9	2.07
25.0	16 17.6	59 41.1	1.86	L. 1 25.8	2.59	15 32.7	56 56.1	1.98	L. 2 51.3	1.98
25.5	16 11.2	59 17.6	2.06	U. 13 56.4	2.52	15 26.3	56 32.7	1.92	U. 15 14.8	1.92
26.0	16 4.2	58 52.1	2.20	L. 2 26.1	2.44	15 20.1	56 10.1	1.83	L. 3 37.3	1.85
26.5	15 56.9	58 25.2	2.28	U. 14 54.7	2.34	15 14.2	55 48.8	1.72	U. 15 59.1	1.80
27.0	15 49.4	57 57.8	2.30	L. 3 22.2	2.24	15 8.9	55 29.1	1.57	L. 4 20.4	1.76
27.5	15 41.9	57 30.3	2.28	U. 15 48.5	2.14	15 4.1	55 11.3	1.41	U. 16 41.3	1.73
28.0	15 34.6	57 3.3	2.22	L. 4 13.5	2.04	14 59.8	54 55.5	1.22	L. 5 1.9	1.72
28.5	15 27.5	56 37.2	2.13	U. 16 37.4	1.96	14 56.0	54 42.1	1.02	U. 17 22.4	1.71
29.0	15 20.7	56 12.4	1.99	L. 5 0.5	1.88	14 53.1	54 31.1	0.81	L. 5 42.9	1.71
29.5	15 14.4	55 49.4	1.84	U. 17 22.6	1.82	14 50.7	54 22.6	0.60	U. 18 3.6	1.72
30.0	15 8.7	55 28.3	1.66	L. 5 44.0	1.77	14 49.1	54 16.6	0.39	L. 6 24.6	1.76
30.5	15 3.5	55 9.4	1.47	U. 18 5.0	1.73	14 48.2	54 13.3	—0.17	U. 18 45.9	1.79
31.0	14 59.0	54 52.8	1.28	L. 6 25.6	1.70	14 48.1	54 12.5	+0.04	L. 7 7.3	1.83
31.5	14 55.2	54 38.7	—1.07	U. 18 45.9	1.70	14 48.6	54 14.2	+0.24	U. 19 29.6	1.88

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

JULY.						AUGUST.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				h m	m				h m	m	
1.0	14 48.1	54 12.5	+0.04	L. 7 7.3	1.83	15 3.7	55 10.0	+1.32	L. 8 13.2	2.19	
1.5	14 48.6	54 14.2	0.24	U. 19 29.6	1.88	15 8.3	55 26.8	1.47	U. 20 39.7	2.22	
2.0	14 49.7	54 18.3	0.44	L. 7 52.5	1.94	15 13.3	55 45.1	1.59	L. 9 6.5	2.24	
2.5	14 51.4	54 24.7	0.62	U. 20 16.1	1.99	15 18.7	56 4.8	1.68	U. 21 33.4	2.24	
3.0	14 53.7	54 33.2	0.79	L. 8 40.4	2.05	15 24.3	56 25.5	1.75	L. 10 0.3	2.23	
3.5	14 56.6	54 43.7	0.94	U. 21 5.4	2.11	15 30.1	56 46.8	1.78	U. 22 27.1	2.22	
4.0	14 59.9	54 55.9	1.08	L. 9 31.1	2.16	15 35.9	57 8.2	1.78	L. 10 53.7	2.20	
4.5	15 3.6	55 9.5	1.19	U. 21 57.2	2.20	15 41.7	57 29.4	1.74	U. 23 20.0	2.17	
5.0	15 7.6	55 24.4	1.28	L. 10 23.8	2.23	15 47.3	57 50.0	1.67	L. 11 45.9	2.14	
5.5	15 11.9	55 40.2	1.35	U. 22 50.6	2.24	15 52.6	58 9.5	1.57			
6.0	15 16.4	55 56.7	1.40	L. 11 17.6	2.24	15 57.6	58 27.7	1.44	U. 0 11.5	2.12	
6.5	15 21.1	56 13.7	1.42	U. 23 44.5	2.23	16 2.1	58 44.2	1.29	L. 12 36.7	2.09	
7.0	15 25.8	56 30.9	1.42			16 6.0	58 58.6	1.11	U. 1 1.7	2.08	
7.5	15 30.4	56 47.9	1.41	L. 12 11.2	2.21	16 9.3	59 10.9	0.92	L. 13 26.5	2.06	
8.0	15 34.9	57 4.6	1.37	U. 0 37.6	2.18	16 12.0	59 20.8	0.73	U. 1 51.3	2.06	
8.5	15 39.3	57 20.9	1.32	L. 13 3.6	2.15	16 14.1	59 28.3	0.53	L. 14 16.1	2.07	
9.0	15 43.6	57 36.4	1.26	U. 1 29.1	2.11	16 15.5	59 33.5	0.33	U. 2 41.0	2.09	
9.5	15 47.6	57 51.0	1.18	L. 13 54.3	2.08	16 16.2	59 36.3	+0.14	L. 15 6.3	2.12	
10.0	15 51.3	58 4.8	1.10	U. 2 19.0	2.05	16 16.4	59 36.9	-0.04	U. 3 31.9	2.16	
10.5	15 54.8	58 17.5	1.01	L. 14 43.4	2.03	16 16.0	59 35.4	0.20	L. 15 58.1	2.21	
11.0	15 57.9	58 29.1	0.92	U. 3 7.6	2.01	16 15.1	59 32.1	0.34	U. 4 24.8	2.26	
11.5	16 0.8	58 39.6	0.83	L. 15 31.7	2.01	16 13.7	59 27.2	0.47	L. 16 52.3	2.31	
12.0	16 3.3	58 49.0	0.73	U. 3 55.7	2.02	16 12.0	59 20.8	0.58	U. 5 20.4	2.37	
12.5	16 5.6	58 57.2	0.64	L. 16 20.0	2.03	16 9.9	59 13.1	0.68	L. 17 49.1	2.41	
13.0	16 7.5	59 4.3	0.54	U. 4 44.5	2.06	16 7.5	59 4.4	0.77	U. 6 18.3	2.45	
13.5	16 9.1	59 10.3	0.45	L. 17 9.5	2.10	16 4.9	58 54.7	0.84	L. 18 47.9	2.47	
14.0	16 10.4	59 15.1	0.35	U. 5 35.1	2.16	16 2.1	58 44.2	0.91	U. 7 17.7	2.48	
14.5	16 11.4	59 18.7	0.25	L. 18 1.3	2.22	15 59.0	58 32.0	0.97	L. 19 47.5	2.47	
15.0	16 12.1	59 21.1	0.14	U. 6 28.3	2.28	15 55.7	58 21.0	1.02	U. 8 16.9	2.43	
15.5	16 12.4	59 22.2	+0.03	L. 18 56.2	2.35	15 52.3	58 8.4	1.07	L. 20 45.9	2.38	
16.0	16 12.3	59 21.8	-0.09	U. 7 24.8	2.41	15 48.7	57 55.2	1.12	U. 9 14.1	2.32	
16.5	16 11.8	59 20.0	0.22	L. 19 54.1	2.47	15 45.0	57 41.5	1.17	L. 21 41.5	2.25	
17.0	16 10.9	59 16.5	0.36	U. 8 24.0	2.51	15 41.1	57 27.2	1.21	U. 10 8.1	2.17	
17.5	16 9.5	59 11.4	0.50	L. 20 54.3	2.53	15 37.1	57 12.5	1.24	L. 22 33.7	2.10	
18.0	16 7.6	59 4.5	0.65	U. 9 24.7	2.53	15 33.0	56 57.4	1.27	U. 10 58.4	2.02	
18.5	16 5.2	58 55.8	0.80	L. 21 55.0	2.50	15 28.8	56 42.0	1.29	L. 23 22.3	1.96	
19.0	16 2.3	58 45.3	0.95	U. 10 24.8	2.46	15 24.5	56 26.4	1.30	U. 11 45.4	1.90	
19.5	15 59.0	58 33.0	1.09	L. 22 54.0	2.39	15 20.3	56 10.8	1.30			
20.0	15 55.2	58 19.1	1.23	U. 11 22.3	2.32	15 16.1	55 55.3	1.28	L. 0 7.9	1.85	
20.5	15 51.0	58 3.6	1.35	L. 23 49.6	2.24	15 11.9	55 40.1	1.25	U. 12 29.8	1.81	
21.0	15 46.4	57 46.8	1.45			15 7.9	55 25.4	1.20	L. 0 51.2	1.78	
21.5	15 41.5	57 28.9	1.53	U. 12 16.0	2.15	15 4.1	55 11.3	1.13	U. 13 12.4	1.75	
22.0	15 36.4	57 10.1	1.58	L. 0 41.3	2.07	15 0.5	54 58.2	1.05	L. 1 33.3	1.74	
22.5	15 31.2	56 50.9	1.61	U. 13 5.6	1.99	14 57.2	54 46.2	0.94	U. 13 54.1	1.74	
23.0	15 25.9	56 31.5	1.61	L. 1 29.0	1.92	14 54.3	54 35.6	0.82	L. 2 15.0	1.75	
23.5	15 20.7	56 12.2	1.58	U. 13 51.7	1.86	14 51.9	54 26.5	0.68	U. 14 36.0	1.76	
24.0	15 15.6	55 53.4	1.53	L. 2 13.7	1.81	14 49.9	54 19.2	0.53	L. 2 57.2	1.78	
24.5	15 10.7	55 35.5	1.45	U. 14 35.2	1.78	14 48.4	54 13.9	0.36	U. 15 18.7	1.81	
25.0	15 6.1	55 18.7	1.34	L. 2 56.4	1.75	14 47.5	54 10.7	-0.17	L. 3 40.7	1.85	
25.5	15 1.9	55 3.4	1.20	U. 15 17.2	1.73	14 47.3	54 9.7	+0.03	U. 16 3.1	1.89	
26.0	14 58.2	54 49.8	1.05	L. 3 37.9	1.73	14 47.7	54 11.2	0.23	L. 4 26.0	1.94	
26.5	14 55.1	54 38.2	0.88	U. 15 58.7	1.74	14 48.8	54 15.2	0.44	U. 16 49.5	1.98	
27.0	14 52.5	54 28.7	0.69	L. 4 19.5	1.75	14 50.6	54 21.7	0.65	L. 5 13.6	2.03	
27.5	14 50.6	54 21.6	0.49	U. 16 40.5	1.77	14 53.1	54 30.8	0.86	U. 17 38.2	2.08	
28.0	14 49.3	54 16.9	0.29	L. 5 1.9	1.80	14 56.2	54 42.4	1.07	L. 6 3.4	2.12	
28.5	14 48.7	54 14.7	-0.07	U. 17 23.8	1.84	15 0.0	54 56.5	1.27	U. 18 29.1	2.15	
29.0	14 48.8	54 15.1	+0.14	L. 5 46.1	1.89	15 4.5	55 13.0	1.47	L. 6 55.1	2.18	
29.5	14 49.6	54 18.1	0.36	U. 18 9.0	1.94	15 9.6	55 31.7	1.65	U. 19 21.4	2.20	
30.0	14 51.1	54 23.7	0.57	L. 6 32.6	1.99	15 15.3	55 52.5	1.81	L. 7 47.9	2.21	
30.5	14 53.3	54 31.8	0.78	U. 18 56.8	2.05	15 21.4	56 15.0	1.94	U. 20 14.4	2.21	
31.0	14 56.2	54 42.3	0.97	L. 7 21.7	2.10	15 27.9	56 39.0	2.04	L. 8 40.8	2.20	
31.5	14 59.7	54 55.1	+1.15	U. 19 47.2	2.15	15 34.8	57 4.0	+2.11	U. 21 7.1	2.18	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

SEPTEMBER.						OCTOBER.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly D ^{ist} .	Meridian Trans.	Hourly D ^{ist} .	Semi-diameter.	Horizontal Parallax.	Hourly D ^{ist} .	Meridian Trans.	Hourly D ^{ist} .	
d				h m	m				h m	m	
1.0	15 41.8	57 29.7	+2.14	L. 9 33.2	2.17	16 12.5	59 22.7	+2.20	L. 9 52.1	2.11	
1.5	15 48.8	57 55.4	2.13	U. 21 59.1	2.15	16 19.5	59 48.2	2.02	U. 22 17.5	2.13	
2.0	15 55.7	58 20.7	2.07	L. 10 24.8	2.13	16 25.8	60 11.2	1.79	L. 10 43.2	2.16	
2.5	16 2.3	58 45.0	1.96	U. 22 50.3	2.12	16 31.2	60 31.1	1.50	U. 23 9.3	2.20	
3.0	16 8.5	59 7.8	1.81	L. 11 15.6	2.11	16 35.6	60 47.3	1.17	L. 11 36.0	2.25	
3.5	16 14.1	59 28.5	1.62	U. 23 40.9	2.11	16 38.8	60 59.2	0.81			
4.0	16 19.0	59 46.6	1.38			16 40.8	61 6.7	0.43	U. 0 3.3	2.31	
4.5	16 23.1	60 1.6	1.11	L. 12 6.3	2.12	16 41.6	61 9.5	+0.04	L. 12 31.4	2.37	
5.0	16 26.3	60 13.3	0.82	U. 0 31.8	2.14	16 41.1	61 7.6	-0.35	U. 1 0.2	2.43	
5.5	16 28.5	60 21.4	0.52	L. 12 57.6	2.17	16 39.3	61 1.1	-0.72	L. 13 29.8	2.49	
6.0	16 29.7	60 25.7	+0.21	U. 1 23.8	2.20	16 36.3	60 50.2	1.06	U. 2 0.0	2.54	
6.5	16 29.9	60 26.4	-0.09	L. 13 50.4	2.24	16 32.4	60 35.6	1.35	L. 14 30.8	2.58	
7.0	16 29.1	60 23.5	0.38	U. 2 17.7	2.29	16 27.5	60 17.7	1.60	U. 3 1.8	2.59	
7.5	16 27.4	60 17.3	0.64	L. 14 45.5	2.35	16 21.9	59 57.1	1.80	L. 15 32.9	2.58	
8.0	16 24.9	60 8.1	0.87	U. 3 13.9	2.40	16 15.8	59 34.5	1.94	U. 4 3.7	2.55	
8.5	16 21.7	59 56.3	1.07	L. 15 43.0	2.44	16 9.2	59 10.5	2.03	L. 16 34.0	2.50	
9.0	16 17.9	59 42.4	1.23	U. 4 12.5	2.47	16 2.5	58 45.7	2.07	U. 5 3.6	2.43	
9.5	16 13.6	59 26.8	1.35	L. 16 42.4	2.49	15 55.7	58 20.7	2.07	L. 17 32.3	2.35	
10.0	16 9.0	59 9.9	1.44	U. 5 12.4	2.50	15 48.9	57 55.9	2.04	U. 6 0.0	2.26	
10.5	16 4.2	58 52.2	1.50	L. 17 42.4	2.48	15 42.3	57 31.7	1.98	L. 18 26.5	2.17	
11.0	15 59.2	58 33.9	1.53	U. 6 12.0	2.45	15 36.0	57 8.4	1.89	U. 6 52.1	2.09	
11.5	15 54.2	58 15.4	1.54	L. 18 41.2	2.40	15 29.9	56 46.3	1.79	L. 19 16.7	2.01	
12.0	15 49.2	57 57.0	1.53	U. 7 9.7	2.34	15 24.2	56 25.4	1.68	U. 7 40.3	1.94	
12.5	15 44.3	57 38.8	1.50	L. 19 37.3	2.26	15 18.9	56 5.9	1.56	L. 20 3.2	1.87	
13.0	15 39.4	57 20.9	1.47	U. 8 4.0	2.19	15 14.0	55 47.9	1.44	U. 8 25.3	1.82	
13.5	15 34.6	57 3.4	1.43	L. 20 29.8	2.11	15 9.5	55 31.2	1.32	L. 20 47.0	1.78	
14.0	15 30.0	56 46.5	1.39	U. 8 54.7	2.04	15 5.4	55 16.1	1.21	U. 9 8.2	1.75	
14.5	15 25.6	56 30.2	1.34	L. 21 18.7	1.97	15 1.6	55 2.3	1.09	L. 21 29.1	1.73	
15.0	15 21.3	56 14.4	1.28	U. 9 42.0	1.91	14 53.3	54 50.0	0.97	U. 9 49.8	1.72	
15.5	15 17.2	55 59.4	1.23	L. 22 4.6	1.86	14 55.3	54 39.0	0.86	L. 22 10.5	1.72	
16.0	15 13.2	55 44.9	1.17	U. 10 26.6	1.81	14 52.7	54 29.4	0.75	U. 10 31.2	1.73	
16.5	15 9.4	55 31.2	1.12	L. 22 48.1	1.78	14 50.4	54 21.1	0.64	L. 22 52.1	1.75	
17.0	15 5.9	55 18.1	1.06	U. 11 9.3	1.76	14 48.5	54 14.0	0.54	U. 11 13.2	1.77	
17.5	15 2.6	55 5.8	0.99	L. 23 30.3	1.75	14 46.9	54 8.1	0.44	L. 23 34.6	1.80	
18.0	14 59.4	54 54.3	0.92	U. 11 51.1	1.74	14 45.6	54 3.5	0.33	U. 11 56.4	1.83	
18.5	14 56.5	54 43.6	0.85			14 44.7	54 0.1	0.23			
19.0	14 53.9	54 33.9	0.76	L. 0 11.9	1.74	14 44.1	53 58.0	0.12	L. 0 18.7	1.87	
19.5	14 51.5	54 25.3	0.67	U. 12 32.8	1.75	14 43.9	53 57.2	-0.01	U. 12 41.4	1.91	
20.0	14 49.5	54 17.8	0.57	L. 0 53.9	1.77	14 44.1	53 57.8	+0.11	L. 1 4.6	1.96	
20.5	14 47.8	54 11.6	0.46	U. 13 15.2	1.79	14 44.7	53 59.9	0.24	U. 13 28.3	2.00	
21.0	14 46.5	54 6.8	0.33	L. 1 36.9	1.82	14 45.6	54 3.6	0.37	L. 1 52.5	2.03	
21.5	14 45.7	54 3.6	0.19	U. 13 59.0	1.86	14 47.1	54 8.9	0.52	U. 14 17.1	2.06	
22.0	14 45.3	54 2.1	-0.04	L. 2 21.5	1.90	14 49.0	54 16.0	0.67	L. 2 42.0	2.09	
22.5	14 45.4	54 2.6	+0.12	U. 14 44.5	1.94	14 51.5	54 25.0	0.83	U. 15 7.1	2.10	
23.0	14 46.0	54 5.0	0.29	L. 3 8.0	1.98	14 54.5	54 36.0	1.00	L. 3 32.4	2.11	
23.5	14 47.3	54 9.6	0.48	U. 15 32.1	2.02	14 58.0	54 49.0	1.17	U. 15 57.7	2.11	
24.0	14 49.2	54 16.5	0.67	L. 3 56.6	2.06	15 2.1	55 4.0	1.34	L. 4 23.0	2.10	
24.5	14 51.7	54 25.7	0.87	U. 16 21.5	2.09	15 6.8	55 21.2	1.52	U. 16 48.1	2.09	
25.0	14 54.8	54 37.3	1.07	L. 4 46.8	2.12	15 12.0	55 40.4	1.69	L. 5 13.1	2.07	
25.5	14 58.6	54 51.3	1.27	U. 17 12.3	2.14	15 17.8	56 1.7	1.85	U. 17 37.9	2.06	
26.0	15 3.1	55 7.8	1.47	L. 5 38.0	2.15	15 24.1	56 24.9	2.01	L. 6 2.4	2.04	
26.5	15 8.2	55 26.6	1.66	U. 18 3.8	2.15	15 30.9	56 49.8	2.14	U. 18 26.8	2.03	
27.0	15 14.0	55 47.6	1.84	L. 6 29.6	2.15	15 38.1	57 16.3	2.26	L. 6 51.1	2.02	
27.5	15 20.3	56 10.7	2.00	U. 18 55.3	2.14	15 45.7	57 44.1	2.35	U. 19 15.3	2.02	
28.0	15 27.1	56 35.7	2.15	L. 7 20.9	2.13	15 53.4	58 12.6	2.39	L. 7 39.5	2.02	
28.5	15 34.3	57 2.3	2.26	U. 19 46.3	2.11	16 1.3	58 41.5	2.40	U. 20 3.9	2.04	
29.0	15 41.9	57 30.1	2.34	L. 8 11.6	2.10	16 9.1	59 10.1	2.34	L. 8 26.6	2.07	
29.5	15 49.6	57 58.5	2.38	U. 20 36.7	2.09	16 16.6	59 37.7	2.24	U. 20 53.7	2.11	
30.0	15 57.4	58 27.2	2.37	L. 9 1.8	2.09	16 23.7	60 3.8	2.07	L. 9 19.3	2.16	
30.5	16 5.1	58 55.5	2.31	U. 21 26.9	2.10	16 30.2	60 27.5	1.84	U. 21 45.7	2.23	
31.0	16 12.5	59 22.7	2.20	L. 9 52.1	2.11	16 35.8	60 48.0	1.55	L. 10 12.8	2.30	
31.5	16 19.5	59 48.2	+2.03	U. 22 17.5	2.13	16 40.3	61 4.8	+1.21	U. 22 40.9	2.38	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

NOVEMBER.						DECEMBER.					
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	
d				h m	m				h m	m	
1.0	16 43.7	61 17.2	+0.84	L. 11 9.9	2.46	16 41.7	61 9.9	-0.40	L. 11 55.3	2.71	
1.5	16 45.8	61 24.9	+0.43	U. 23 39.9	2.54	16 39.8	61 2.7	0.80			
2.0	16 46.5	61 27.5	0.00			16 36.5	60 50.8	1.17	U. 0 27.8	2.70	
2.5	16 45.8	61 24.9	-0.43	L. 12 10.7	2.60	16 32.1	60 34.6	1.51	L. 12 50.9	2.65	
3.0	16 43.7	61 17.2	0.84	U. 0 42.3	2.65	16 26.7	60 14.6	1.80	U. 1 31.4	2.58	
3.5	16 40.3	61 4.7	1.22	L. 13 14.3	2.68	16 20.4	59 51.4	2.04	L. 14 1.9	2.49	
4.0	16 35.7	60 47.8	1.56	U. 1 46.5	2.68	16 13.3	59 25.6	2.22	U. 2 31.2	2.39	
4.5	16 30.1	60 27.2	1.85	L. 14 18.5	2.65	16 5.8	58 58.0	2.35	L. 14 59.3	2.29	
5.0	16 23.6	60 3.5	2.08	U. 2 49.9	2.59	15 58.0	58 29.3	2.41	U. 3 26.1	2.18	
5.5	16 16.5	59 37.3	2.25	L. 15 20.5	2.51	15 50.0	58 0.1	2.42	L. 15 51.7	2.09	
6.0	16 9.0	59 9.6	2.35	U. 3 50.0	2.42	15 42.2	57 31.2	2.37	U. 4 16.2	2.00	
6.5	16 1.2	58 40.9	2.40	L. 16 18.4	2.31	15 34.5	57 3.1	2.29	L. 16 39.7	1.93	
7.0	15 53.3	58 12.1	2.39	U. 4 45.6	2.21	15 27.2	56 36.2	2.17	U. 5 2.4	1.86	
7.5	15 45.5	57 43.6	2.24	L. 17 11.5	2.12	15 20.3	56 11.0	2.02	L. 17 24.4	1.81	
8.0	15 38.0	57 15.9	2.25	U. 5 36.4	2.03	15 14.0	55 47.6	1.85	U. 5 46.0	1.78	
8.5	15 30.8	56 49.5	2.13	L. 18 0.2	1.95	15 8.2	55 26.5	1.66	L. 18 7.1	1.75	
9.0	15 24.1	56 24.7	1.99	U. 6 23.2	1.88	15 3.1	55 7.7	1.47	U. 6 28.0	1.74	
9.5	15 17.8	56 1.7	1.83	L. 18 45.4	1.83	14 58.6	54 51.2	1.27	L. 18 48.9	1.74	
10.0	15 12.1	55 40.7	1.67	U. 7 7.0	1.78	14 54.8	54 37.2	1.07	U. 7 9.7	1.74	
10.5	15 6.9	55 21.6	1.50	L. 19 28.2	1.75	14 51.6	54 25.6	0.87	L. 19 30.7	1.76	
11.0	15 2.3	55 4.6	1.33	U. 7 49.0	1.73	14 49.1	54 16.4	0.67	U. 7 52.0	1.79	
11.5	14 58.2	54 49.6	1.16	L. 20 9.7	1.72	14 47.3	54 9.6	0.48	L. 20 13.6	1.82	
12.0	14 54.7	54 36.8	0.99	U. 8 30.3	1.72	14 46.0	54 4.9	0.30	U. 8 35.7	1.86	
12.5	14 51.7	54 25.8	0.83	L. 20 51.0	1.73	14 45.3	54 2.5	-0.12	L. 20 58.3	1.90	
13.0	14 49.2	54 16.8	0.67	U. 9 11.9	1.75	14 45.2	54 2.0	+0.04	U. 9 21.4	1.95	
13.5	14 47.3	54 9.7	0.52	L. 21 33.0	1.78	14 45.6	54 3.4	0.19	L. 21 45.0	1.99	
14.0	14 45.8	54 4.2	0.39	U. 9 54.5	1.81	14 46.4	54 6.5	0.32	U. 10 9.1	2.03	
14.5	14 44.8	54 0.4	0.25	L. 22 16.4	1.85	14 47.7	54 11.1	0.44	L. 22 33.8	2.07	
15.0	14 44.2	53 58.2	0.12	U. 10 38.9	1.89	14 49.3	54 17.1	0.55	U. 10 58.8	2.10	
15.5	14 44.0	53 57.4	-0.01	L. 23 1.8	1.93	14 51.3	54 24.4	0.65	L. 23 24.2	2.12	
16.0	14 44.1	53 57.9	+0.10	U. 11 25.3	1.98	14 53.6	54 32.8	0.74	U. 11 49.7	2.13	
16.5	14 44.6	53 59.8	0.21	L. 23 49.2	2.02	14 56.1	54 42.1	0.82			
17.0	14 45.5	54 2.9	0.31			14 58.9	54 52.4	0.89	L. 0 15.3	2.13	
17.5	14 46.6	54 7.2	0.41	U. 12 13.7	2.05	15 2.0	55 3.5	0.96	U. 12 40.8	2.12	
18.0	14 48.1	54 12.7	0.51	L. 0 38.5	2.08	15 5.2	55 15.4	1.02	L. 1 6.2	2.10	
18.5	14 50.0	54 19.5	0.62	U. 13 3.6	2.10	15 8.6	55 28.0	1.07	U. 13 31.3	2.07	
19.0	14 52.2	54 27.5	0.73	L. 1 28.9	2.11	15 12.2	55 41.2	1.13	L. 1 56.0	2.04	
19.5	14 54.7	54 36.9	0.84	U. 13 54.2	2.11	15 16.0	55 55.1	1.19	U. 14 20.3	2.01	
20.0	14 57.6	54 47.6	0.95	L. 2 19.5	2.10	15 20.0	56 9.7	1.24	L. 2 44.3	1.98	
20.5	15 0.9	54 59.6	1.06	U. 14 44.6	2.09	15 24.1	56 24.9	1.29	U. 15 8.0	1.96	
21.0	15 4.6	55 13.1	1.19	L. 3 9.5	2.06	15 28.4	56 40.7	1.35	L. 3 31.4	1.94	
21.5	15 8.7	55 28.1	1.32	U. 15 34.2	2.04	15 32.9	56 57.2	1.40	U. 15 54.6	1.93	
22.0	15 13.2	55 44.7	1.44	L. 3 58.5	2.01	15 37.6	57 14.2	1.45	L. 4 17.7	1.93	
22.5	15 18.1	56 2.7	1.56	U. 16 22.5	1.99	15 42.4	57 31.9	1.49	U. 16 40.8	1.93	
23.0	15 23.4	56 22.2	1.69	L. 4 46.2	1.97	15 47.3	57 50.0	1.52	L. 5 4.1	1.95	
23.5	15 29.1	56 43.2	1.80	U. 17 9.7	1.96	15 52.3	58 8.4	1.54	U. 17 27.7	1.98	
24.0	15 35.2	57 5.5	1.91	L. 5 33.2	1.95	15 57.4	58 27.0	1.55	L. 5 51.7	2.03	
24.5	15 41.6	57 29.0	2.00	U. 17 56.6	1.95	16 2.4	58 45.5	1.53	U. 18 16.4	2.08	
25.0	15 48.2	57 53.4	2.06	L. 6 20.1	1.97	16 7.4	59 3.8	1.49	L. 6 41.8	2.15	
25.5	15 55.1	58 18.5	2.10	U. 18 43.8	1.99	16 12.1	59 21.3	1.41	U. 19 8.1	2.23	
26.0	16 2.0	58 43.9	2.11	L. 7 8.0	2.03	16 16.6	59 37.7	1.30	L. 7 35.3	2.31	
26.5	16 8.8	59 9.1	2.07	U. 19 32.7	2.08	16 20.6	59 52.5	1.15	U. 20 3.6	2.40	
27.0	16 15.5	59 33.6	1.98	L. 7 58.1	2.15	16 24.1	60 5.3	0.97	L. 8 32.9	2.48	
27.5	16 21.8	59 56.7	1.84	U. 20 24.3	2.22	16 27.0	60 15.7	0.74	U. 21 3.2	2.56	
28.0	16 27.5	60 17.8	1.65	L. 8 51.5	2.31	16 29.0	60 23.1	0.48	L. 9 34.3	2.62	
28.5	16 32.5	60 36.3	1.40	U. 21 19.8	2.40	16 30.1	60 27.2	+0.19	U. 22 5.9	2.65	
29.0	16 36.7	60 51.5	1.11	L. 9 49.1	2.49	16 30.3	60 27.7	-0.11	L. 10 37.8	2.66	
29.5	16 39.8	61 2.9	0.77	U. 22 19.5	2.57	16 29.4	60 24.5	0.43	U. 23 9.6	2.64	
30.0	16 41.7	61 9.9	+0.39	L. 10 50.8	2.64	16 27.4	60 17.4	0.75	L. 11 40.9	2.58	
30.5	16 42.4	61 12.3	0.00	U. 23 22.9	2.69	16 24.5	60 6.7	1.05			
31.0	16 41.7	61 9.9	-0.40	L. 11 55.3	2.71	16 20.5	59 52.3	1.33	U. 0 11.5	2.51	
31.5	16 39.8	61 2.7	-0.80			16 15.9	59 34.7	-1.58	L. 12 41.2	2.43	

WASHINGTON MEAN TIME.

PHASES.

Month.	Last Quarter.	New Moon.	First Quarter.	Full Moon.	Last Quarter.	New Moon.
	d h m	d h m	d h m	d h m		
January	3 8 46.7	10 10 19.2	18 10 51.8	25 23 57.5		
February	1 16 51.7	9 2 56.4	17 7 11.4	24 11 35.2		
March	3 2 8.2	10 20 28.7	19 0 23.8	25 21 7.2		
April	1 13 15.9	9 13 47.5	17 13 37.3	24 5 15.4	d h m	
May	1 2 23.8	9 5 59.3	16 22 55.1	23 12 58.0	30 17 17.1	
June		7 20 30.1	15 5 8.1	21 21 15.0	29 9 32.5	
July		7 9 4.3	14 9 39.6	21 6 57.8	29 2 43.4	
August		5 19 46.3	12 14 7.6	19 18 43.3	27 20 15.0	
September		4 5 4.7	10 20 8.1	18 8 53.6	26 13 16.3	
October		3 13 49.3	10 5 1.2	18 1 30.2	26 4 46.5	
November		1 22 56.2	8 17 36.4	16 19 58.8	24 17 59.2	d h m
December		1 9 9.2	8 10 1.5	16 14 59.8	24 4 43.8	30 20 46.4

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Month.	Perigee.	Apogee.	Perigee.	GREATEST LIBRATION.			
	d h	d h	d h	d h m	d h m		
January	2 2.9	17 0.5	28 17.7	10 3 53 s.w.	22 23 37 s.e.		
February		13 18.3	25 20.4	5 7 3 s.w.	20 1 9 s.e.		
March		13 6.9	26 6.8	4 10 14 s.w.	20 7 12 s.e.	d h m	
April		9 10.2	23 17.4	1 10 54 s.w.	17 12 15 s.e.	29 16 52 s.w.	
May		6 14.5	22 0.9		15 9 29 s.e.	27 21 25 s.w.	
June		3 4.9	18 22.9		11 10 39 s.e.	24 20 9 s.w.	
July	15 15.2	30 21.9					
August	9 21.5	28 16.1			7 18 20 s.e.	22 7 32 s.w.	
September	6 8.1	25 10.7		3 19 37 s.e.	17 23 12 s.w.	31 13 13 s.e.	
October	4 13.1	22 3.5			13 9 32 s.w.	28 15 58 s.e.	
November	2 0.0	19 13.0			10 22 5 s.w.	26 22 46 s.e.	
December		15 13.3	30 12.0		8 1 4 s.w.	24 3 50 s.e.	
		12 20.9	28 19.8		6 8 15 s.w.	21 19 35 s.e.	

MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables.

I = the inclination of the moon's equator $1^{\circ} 28'.8$,

Ω = mean longitude of moon's ascending node (see page 250),

C = the angle which the mean meridian of the moon's disc makes with the circle of declination reckoned from north to west on the apparent disc.

λ , β , α' and δ' the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

$$\Delta \lambda = 0'.57 \sin 2 (\lambda - \Omega),$$

$$\alpha = \cos (\Omega - \lambda) \sin I,$$

$$\tan \beta = \sin (\Omega - \lambda) \tan I.$$

In these formulas, the tables p. 8 of the Appendix may be substituted.

The libration in latitude = $b = B - \beta$.

The libration in longitude = $l = \lambda + \Delta \lambda + \alpha b - C$.

$$\sin C = \sin i \frac{\cos (C + l - \Omega + \Delta)}{\cos \delta'} = - \sin i \frac{\cos (\alpha' - \Omega)}{\cos b}.$$

WASHINGTON MEAN TIME.

MOON'S EQUATOR.

Sidereal Date Oh.	i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	Ω' Ascending Node on Earth's Equator.	ζ Moon's Mean Longitude.
^d 0	22° 54.2	110° 13.6	3° 29.3	151° 33.7
10	22 55.0	109 41.3	3 30.0	202 57.9
20	22 55.8	109 9.0	3 30.7	54 22.2
30	22 56.7	108 36.7	3 31.3	185 46.4
40	22 57.5	108 4.4	3 32.0	317 10.7
50	22 58.3	107 32.1	3 32.6	88 34.9
60	22 59.1	106 59.9	3 33.2	219 59.2
70	22 59.9	106 27.6	3 33.8	351 23.4
80	23 0.7	105 55.4	3 34.4	122 47.7
90	23 1.5	105 23.2	3 34.9	254 11.9
100	23 2.3	104 51.0	3 35.5	25 36.2
110	23 3.1	104 18.9	3 36.0	157 0.4
120	23 3.9	103 46.7	3 36.5	288 24.7
130	23 4.7	103 14.6	3 37.0	59 48.9
140	23 5.5	102 42.5	3 37.5	191 13.2
150	23 6.3	102 10.4	3 38.0	322 37.4
160	23 7.1	101 38.4	3 38.4	94 1.6
170	23 7.9	101 6.3	3 38.8	225 25.9
180	23 8.7	100 34.3	3 39.2	356 50.1
190	23 9.5	100 2.3	3 39.6	128 14.4
200	23 10.3	99 30.3	3 40.0	259 38.6
210	23 11.1	98 58.4	3 40.3	31 2.9
220	23 11.9	98 26.4	3 40.6	162 27.1
230	23 12.7	97 54.5	3 40.9	293 51.4
240	23 13.5	97 22.5	3 41.2	65 15.6
250	23 14.3	96 50.6	3 41.5	196 39.9
260	23 15.1	96 10.7	3 41.7	328 4.1
270	23 15.9	95 48.9	3 41.9	99 28.4
280	23 16.8	95 15.0	3 42.1	230 52.6
290	23 17.6	94 43.2	3 42.3	2 16.9
300	23 18.4	94 11.3	3 42.5	133 41.1
310	23 19.2	93 39.5	3 42.6	265 5.3
320	23 20.0	93 7.8	3 42.7	36 29.6
330	23 20.9	92 36.0	3 42.8	167 53.8
340	23 21.7	92 4.3	3 42.8	299 18.1
350	23 22.5	91 32.5	3 42.9	70 42.3
360	23 23.3	91 0.8	3 42.9	202 6.6
370	23 24.1	90 29.2	3 42.9	333 30.8

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.												
Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.				
Jan. d	h m s	m s	° ' "	° ' "							d h m	d
1	17 35 42.64	35 24.35	23 16 3.4	15 30.7	+9.41894	-0.6696	+3.97	+5.18			0 22 50.3	0
2	17 42 2.35	41 44.51	23 26 45.6	26 17.0	9.42318	9.6264	3.94	5.20			1 22 52.7	1
3	17 48 25.64	48 8.29	23 36 22.7	35 58.1	9.42712	9.5766	3.91	5.21			2 22 55.1	2
4	17 54 52.29	54 35.47	23 44 52.8	44 32.1	9.43078	9.5184	3.88	5.22			3 22 57.6	3
5	18 1 22.09	1 5.83	23 52 13.9	51 56.9	9.43418	9.4493	3.85	5.23			4 23 0.2	4
6	18 7 54.85	7 39.18	23 58 24.1	58 10.7	9.43734	9.3646	3.83	5.24			5 23 2.8	5
7	18 14 30.37	14 15.33	24 3 21.7	3 11.8	9.44028	9.2566	3.80	5.25			6 23 5.4	6
8	18 21 8.48	20 54.09	24 7 5.5	6 58.8	9.44301	9.1099	3.77	5.26			7 23 8.1	7
9	18 27 49.02	27 35.31	24 9 33.8	9 30.1	9.44556	8.8804	3.74	5.26			8 23 10.9	8
10	18 34 31.84	34 18.84	24 10 45.2	10 44.2	9.44793	-8.3434	3.71	5.27			9 23 13.6	9
11	18 41 16.79	41 4.52	24 10 38.5	10 39.9	9.45013	+8.5133	3.68	5.28			10 23 16.4	10
12	18 48 3.71	47 52.19	24 9 12.5	9 16.1	9.45217	8.9451	3.65	5.29			11 23 19.3	11
13	18 54 52.48	54 41.72	24 6 26.0	6 31.5	9.45406	9.1597	3.62	5.29			12 23 22.2	12
14	19 1 42.97	1 32.99	24 2 17.9	2 25.0	9.45581	9.3041	3.59	5.29			13 23 25.1	13
15	19 8 35.04	8 25.86	23 56 47.2	56 55.5	9.45742	9.4135	3.55	5.30			14 23 28.0	14
16	19 15 28.59	15 20.23	23 49 53.0	50 2.2	9.45891	9.5016	3.51	5.30			15 23 31.0	15
17	19 22 23.51	22 15.99	23 41 34.3	41 44.1	9.46027	9.5758	3.47	5.31			16 23 33.9	16
18	19 29 19.67	29 13.00	23 31 50.2	32 0.3	9.46151	9.6395	3.43	5.31			17 23 36.9	17
19	19 36 16.95	36 11.15	23 20 39.9	20 49.9	9.46264	9.6956	3.39	5.32			18 23 40.0	18
20	19 43 15.28	43 10.34	23 8 2.7	8 12.2	9.46366	9.7457	3.34	5.32			19 23 43.0	19
21	19 50 14.54	50 10.48	22 53 57.8	54 6.5	9.46457	9.7909	3.29	5.32			20 23 46.0	20
22	19 57 14.66	57 11.48	22 38 24.6	38 32.0	9.46538	9.8322	3.24	5.33			21 23 49.1	21
23	20 4 15.51	4 13.22	22 21 22.2	21 28.0	9.46610	9.8702	3.19	5.33			22 23 52.2	22
24	20 11 17.01	11 15.62	22 2 50.1	2 53.9	9.46673	9.9053	3.13	5.34			23 23 55.3	23
25	20 18 19.07	18 18.59	21 42 47.8	42 49.3	9.46727	9.9380	3.06	5.34			24 23 58.4	24
26	20 25 21.62	25 22.05	21 21 15.0	21 13.6	9.46770	9.9686	2.96	5.34			25 0 1.5	25
27	20 32 24.54	32 25.88	20 58 11.0	58 6.4	9.46804	9.9972	2.83	5.34			26 0 4.6	26
28	20 39 27.74	39 30.00	20 33 35.4	33 27.3	9.46829	0.0241	2.68	5.34			26 0 7.7	27
29	20 46 31.15	46 34.33	20 7 28.1	7 16.0	9.46843	0.0495	+2.33	5.34			26 0 10.8	28
30	20 53 34.65	53 38.75	19 39 49.0	39 32.5	9.46847	0.0735	-1.38	5.34			30 0 13.9	29
31	21 0 38.14	0 43.16	19 10 38.1	10 16.8	9.46841	0.0963	2.49	5.34			31 0 17.1	30
Feb. 1	21 7 41.50	7 47.43	18 39 55.5	39 29.0	9.46822	0.1179	2.78	5.34			1 0 20.2	31
2	21 14 44.61	14 51.45	18 7 41.4	7 9.4	9.46789	0.1384	2.97	5.33			2 0 23.3	32
3	21 21 47.34	21 55.08	17 33 56.3	33 18.3	9.46740	0.1578	3.12	5.33			3 0 26.4	33
4	21 28 49.52	28 58.16	16 58 40.9	57 56.7	9.46674	0.1762	3.25	5.33			4 0 29.5	34
5	21 35 50.97	36 0.50	16 21 56.3	21 5.4	9.46585	0.1936	3.36	5.32			5 0 32.6	35
6	21 42 51.46	43 1.86	15 43 43.7	42 45.8	9.46473	0.2101	3.46	5.31			6 0 35.7	36
7	21 49 50.75	50 2.00	15 4 5.0	2 59.9	9.46333	0.2256	3.56	5.30			7 0 38.7	37
8	21 56 48.54	57 0.63	14 23 2.5	21 49.9	9.46160	0.2401	3.65	5.29			8 0 41.7	38
9	22 3 44.51	3 57.40	13 40 38.8	39 18.6	9.45947	0.2537	3.73	5.27			9 0 44.7	39
10	22 10 38.23	10 51.89	12 56 57.4	55 29.4	9.45686	0.2663	3.81	5.25			10 0 47.7	40
11	22 17 29.24	17 43.63	12 12 2.3	10 26.4	9.45369	0.2777	3.89	5.22			11 0 50.6	41
12	22 24 16.97	24 32.04	11 25 58.5	24 14.8	9.44986	0.2880	3.97	5.17			12 0 53.5	42
13	22 31 0.78	31 16.46	10 38 52.4	37 0.9	9.44522	0.2970	4.05	5.12			13 0 56.3	43
14	22 37 39.89	37 56.11	9 50 50.9	48 52.0	9.43963	0.3047	4.13	5.05			14 0 59.0	44
15	22 44 13.44	44 30.12	8 68 2.3	59 56.4	9.43291	0.3110	4.20	4.95			15 1 1.6	45
16	22 50 40.43	50 57.47	8 12 36.5	10 23.9	9.42489	0.3157	4.27	4.80			16 1 4.1	46
17	22 56 59.71	57 17.00	7 22 44.4	20 26.0	9.41530	0.3186	4.34	+4.50			17 1 6.5	47
18	23 3 10.00	3 27.40	6 32 38.9	30 15.6	9.40386	0.3194	4.40	-3.38			18 1 8.7	48
19	23 9 9.84	9 27.21	5 42 34.3	40 7.2	9.39028	0.3181	4.46	4.61			19 1 10.8	49
20	23 14 57.66	15 14.83	4 52 46.7	50 17.0	9.37417	0.3144	4.51	4.91			20 1 12.6	50
21	23 20 31.76	20 48.55	4 3 33.2	1 2.5	9.35609	0.3080	4.56	5.11			21 1 14.3	51
22	23 25 50.30	26 6.52	3 15 12.9	12 42.8	9.33249	0.2985	4.61	5.25			22 1 15.6	52
23	23 30 51.34	31 6.80	2 28 5.9	25 38.2	9.30675	0.2855	4.66	5.35			23 1 16.7	53
24	23 35 32.92	35 47.43	1 42 32.6	40 9.2	9.27409	0.2688	4.71	5.44			24 1 17.4	54
25	23 39 53.06	40 6.43	0 58 54.8	56 37.5	9.23645	0.2478	4.75	5.52			25 1 17.7	55
26	23 43 49.77	44 1.82	0 17 34.6	15 25.2	9.19165	0.2217	4.78	5.59			26 1 17.7	56
27	23 47 21.16	47 31.73	0 21 6.6	23 6.0	9.13760	0.1898	4.81	5.64			27 1 17.3	57
28	23 50 25.47	50 34.44	0 56 47.3	58 35.2	9.07163	0.1511	4.84	5.68			28 1 16.4	58
29	23 53 1.14	53 8.42	1 29 7.4	30 42.4	8.98937	0.1038	4.86	5.72			29 1 15.0	59
30	23 55 6.84	55 12.39	1 57 47.5	59 8.5	8.88317	0.0457	4.87	5.75			30 1 13.2	60
31	23 56 41.55	56 45.38	2 22 30.0	23 36.3	+8.73771	+9.2735	-4.88	-5.78			31 1 10.8	61

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient of t .		Log Coefficient of t^2 .		Mean Solar Time of Meridian Transit.	Side-Real Date of Transit.						
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.								
Mar.	d	h	m	s	m	s	°	'					d	h	m	s				
	1	23	53	1.14	53	8.42	+	1	29	7.4	30	42.4	+8.98037	+0.1038	-4.86	-5.72	1	1	15.0	59
	2	23	55	6.84	55	12.39		1	57	47.5	59	8.5	8.88317	0.0457	4.87	5.75	2	1	13.2	60
	3	23	56	41.55	56	45.38		2	22	30.0	23	36.3	8.73771	9.9735	4.88	5.78	3	1	10.8	61
	4	23	57	44.60	57	46.77		2	42	59.5	43	50.8	8.51309	9.8810	4.88	5.80	4	1	7.9	62
	5	23	58	15.72	58	16.37		2	59	2.9	59	30.4	+8.08148	9.7574	4.88	5.82	5	1	4.4	63
	6	23	58	15.14	58	14.43		3	10	29.8	10	52.3	-8.05129	9.5772	4.87	5.83	6	1	0.4	64
	7	23	57	43.56	57	41.79		3	17	13.5	17	23.3	8.50961	+9.2554	4.85	5.84	7	0	55.9	65
	8	23	56	42.26	56	39.56		3	19	10.9	19	9.8	8.71872	-8.2608	4.82	5.83	8	0	51.0	66
	9	23	55	13.07	55	9.82		3	16	23.3	16	13.5	8.85043	9.3300	4.78	5.82	9	0	45.6	67
	10	23	53	18.36	53	14.87		3	8	57.3	8	41.2	8.94231	9.6054	4.73	5.80	10	0	39.7	68
	11	23	51	1.06	50	57.63		2	57	4.4	56	44.8	9.00881	9.7653	4.66	5.78	11	0	33.5	69
	12	23	48	24.58	48	21.50		2	41	1.4	40	41.2	9.05697	9.8741	4.56	5.74	12	0	27.0	70
	13	23	45	32.77	45	30.28		2	21	10.5	20	52.4	9.09068	9.9529	4.43	5.68	13	0	20.2	71
	14	23	42	29.76	42	28.05		1	57	58.6	57	45.1	9.11223	0.0111	4.22	5.61	14	0	13.2	72
	15	23	39	19.82	39	19.01		1	31	56.9	31	49.9	9.12323	0.0538	-3.79	5.51	15	0	6.1	73
	16	23	36	7.28	36	7.41		1	3	39.3	3	40.4	9.12428	0.0841	+3.60	5.38	15	23	59.0	74
	17	23	32	56.39	32	57.44		0	33	41.7	33	51.9	9.11593	0.1040	4.13	5.18	16	23	51.9	75
	18	23	29	51.13	30	53.01	+	0	2	40.6	3	0.2	9.09841	0.1146	4.35	-4.82	17	23	45.0	76
	19	23	26	55.09	26	57.67	-	0	28	48.2	28	19.5	9.07150	0.1171	4.48	+4.16	18	23	38.2	77
	20	23	24	11.50	24	14.59		0	60	11.1	59	34.1	9.03464	0.1122	4.56	4.95	19	23	31.5	78
	21	23	21	43.07	21	46.46		1	30	57.1	30	13.1	8.98682	0.1002	4.62	5.19	20	23	25.1	79
	22	23	19	31.99	19	35.46		1	60	38.9	59	49.4	8.92622	0.0816	4.66	5.32	21	23	19.0	80
	23	23	17	39.94	17	43.96		2	28	53.1	27	59.7	8.84964	0.0566	4.68	5.41	22	23	13.2	81
	24	23	16	8.13	16	11.09		2	55	20.2	54	24.7	8.75143	0.0250	4.70	5.47	23	23	7.7	82
	25	23	14	57.31	14	59.72		3	19	44.7	18	48.9	8.68026	9.9868	4.71	5.51	24	23	2.6	83
	26	23	14	7.85	14	9.55		3	41	54.9	41	0.4	8.42901	9.9414	4.71	5.53	25	22	57.8	84
	27	23	13	39.81	13	40.64		4	1	42.4	0	50.8	-8.08156	9.8879	4.71	5.55	26	22	53.4	85
	28	23	13	32.94	13	32.79		4	19	1.4	18	14.0	+7.39370	9.8250	4.70	5.56	27	22	49.3	86
	29	23	13	46.78	13	45.57		4	33	48.5	33	6.5	8.22141	9.7502	4.69	5.56	28	22	45.6	87
	30	23	14	20.73	14	18.40		4	46	2.7	45	27.0	8.48227	9.6596	4.67	5.56	29	22	42.2	88
31	23	15	14.05	15	10.56		4	55	44.7	55	15.9	8.63877	9.5457	4.65	5.56	30	22	39.2	89	
Apr.	1	23	16	25.93	16	21.27		5	2	55.7	2	34.7	8.74905	9.3935	4.63	5.55	0	22	36.4	90
	2	23	17	55.49	17	49.67		5	7	38.5	7	25.7	8.83302	9.1633	4.61	5.54	1	22	34.0	91
	3	23	19	41.85	19	34.88		5	9	56.4	9	52.0	8.89999	-8.6558	4.59	5.53	2	22	31.8	92
	4	23	21	44.11	21	36.02		5	9	53.1	9	57.3	8.95506	+8.7017	4.56	5.52	3	22	29.9	93
	5	23	24	1.40	23	52.23		5	7	32.7	7	45.6	9.00134	9.1584	4.53	5.50	4	22	28.2	94
	6	23	26	32.86	26	22.65		5	2	59.5	3	21.1	9.04086	9.3706	4.50	5.49	5	22	26.8	95
	7	23	29	17.67	29	6.47		4	56	17.7	56	47.9	9.07507	9.5086	4.47	5.48	6	22	25.6	96
	8	23	32	15.06	32	2.93		4	47	31.8	48	10.4	9.10503	9.6099	4.44	5.46	7	22	24.6	97
	9	23	35	24.32	35	11.31		4	36	45.9	37	32.7	9.13150	9.6894	4.42	5.45	8	22	23.8	98
	10	23	38	44.77	38	30.94		4	24	4.2	24	58.9	9.15509	9.7545	4.40	5.43	9	22	23.2	99
	11	23	42	15.78	42	1.20		4	9	30.8	10	33.2	9.17625	9.8092	4.37	5.41	10	22	22.7	100
	12	23	45	56.79	45	41.51		3	53	9.5	54	19.3	9.19538	9.8562	4.35	5.40	11	22	22.4	101
	13	23	49	47.26	49	31.34		3	35	4.2	36	21.0	9.21278	9.8971	4.33	5.38	12	22	22.3	102
	14	23	53	46.74	53	30.23		3	15	18.4	16	41.9	9.22872	9.9333	4.31	5.37	13	22	22.4	103
	15	23	57	54.80	57	37.75		2	53	55.5	55	25.3	9.24341	9.9656	4.29	5.35	14	22	22.5	104
	16	0	2	11.04	1	53.50		2	30	58.8	32	34.5	9.25703	9.9947	4.27	5.34	15	22	22.8	106
	17	0	6	35.15	6	17.17		2	6	31.5	8	12.8	9.26974	0.0211	4.25	5.32	16	22	23.3	107
	18	0	11	6.85	10	48.48		1	40	36.7	42	23.2	9.28167	0.0452	4.24	5.31	17	22	23.9	108
	19	0	15	45.91	15	27.19		1	13	17.2	15	8.4	9.29295	0.0672	4.23	5.29	18	22	24.6	109
	20	0	20	32.11	20	13.08		0	44	35.8	46	31.3	9.30366	0.0875	4.22	5.28	19	22	25.4	110
	21	0	25	25.29	25	6.00	-	0	14	35.2	16	34.6	9.31390	0.1063	4.22	5.26	20	22	26.3	111
	22	0	30	25.32	30	5.81	+	0	16	41.9	14	39.0	9.32376	0.1237	4.22	5.25	21	22	27.4	112
	23	0	35	32.11	35	12.42		0	49	12.9	47	6.9	9.33328	0.1399	4.22	5.23	22	22	28.6	113
	24	0	40	45.50	40	25.76		1	22	55.3	20	46.6	9.34254	0.1550	4.21	5.22	23	22	29.8	114
	25	0	46	5.74	45	45.81		1	57	46.5	55	35.6	9.35160	0.1690	4.21	5.20	24	22	31.2	115
	26	0	51	32.58	51	12.58		2	33	44.1	31	31.4	9.36051	0.1821	4.21	5.18	25	22	32.7	116
	27	0	57	6.15	56	46.12		3	10	45.4	8	31.5	9.36931	0.1943	4.22	5.16	26	22	34.3	117
	28	1	2	46.51	2	26.48		3	48	48.0	46	33.3	9.37805	0.2057	4.22	5.14	27	22	36.1	118
	29	1	8	33.76	8	13.77		4	27	49.2	25	34.2	9.38674	0.2163	4.23	5.12	28	22	37.9	119
	30	1	14	28.02	14	8.11		5	7	46.2	5	31.4	9.39543	0.2262	4.24	5.10	29	22	39.9	120
	31	1	20	29.45	20	9.66	+	5	48	36.2	46	22.1	+9.40415	+0.2353	+4.25	+5.07	30	22	41.9	121

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Side-Real Date of Transit.	
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.			
May	d	h m s	m s	° ' "					d h m	d	
1	1	20 29.45	20 9.66	+ 5 48 36.2	46 22.1	+9.40415	+0.2353	+4.25	+5.07	0 22 41.9	121
2	1	26 38.22	26 18.60	6 30 16.3	28 3.3	9.41290	0.2437	4.26	5.03	1 22 44.1	122
3	1	32 54.52	32 35.11	7 12 43.1	10 31.9	9.42172	0.2514	4.27	5.00	2 22 46.5	123
4	1	39 18.57	38 59.42	7 55 53.3	53 44.4	9.43061	0.2584	4.29	4.97	3 22 48.9	124
5	1	45 50.61	45 31.77	8 39 43.2	37 37.2	9.43959	0.2646	4.30	4.93	4 22 51.5	125
6	1	52 30.87	52 12.40	9 24 8.8	22 6.3	9.44865	0.2701	4.31	4.88	5 22 54.2	126
7	1	59 19.61	59 1.57	10 9 5.7	7 7.3	9.45779	0.2747	4.32	4.80	6 22 57.1	127
8	2	6 17.08	5 59.54	10 54 29.1	52 35.4	9.46701	0.2784	4.34	4.70	7 23 0.1	128
9	2	13 23.54	13 6.57	11 40 13.6	38 25.2	9.47629	0.2812	4.35	4.56	8 23 3.3	129
10	2	20 39.22	20 22.89	12 26 13.2	24 30.7	9.48559	0.2831	4.36	4.32	9 23 6.6	130
11	2	28 4.34	27 48.74	13 12 21.6	10 45.6	9.49488	0.2839	4.36	+3.49	10 23 10.1	131
12	2	35 39.07	35 24.30	13 58 31.3	57 2.5	9.50413	0.2836	4.37	-4.19	11 23 13.7	132
13	2	43 23.55	43 9.71	14 44 34.7	43 13.4	9.51327	0.2819	4.37	4.56	12 23 17.5	133
14	2	51 17.85	51 5.04	15 30 22.8	29 9.6	9.52223	0.2787	4.37	4.77	13 23 21.5	134
15	2	59 21.94	59 10.27	16 15 46.2	14 41.6	9.53096	0.2739	4.37	4.93	14 23 25.6	135
16	3	7 35.70	7 25.29	16 60 34.6	59 38.9	9.53937	0.2673	4.36	5.05	15 23 29.9	136
17	3	15 58.92	15 49.90	17 44 36.8	43 50.3	9.54737	0.2588	4.34	5.14	16 23 34.4	137
18	3	24 31.27	24 23.74	18 27 41.4	27 4.2	9.55488	0.2481	4.32	5.22	17 23 39.0	138
19	3	33 12.21	33 6.29	19 9 36.2	9 8.3	9.56179	0.2349	4.28	5.29	18 23 43.7	139
20	3	42 1.09	41 56.89	19 50 8.8	49 50.0	9.56797	0.2190	4.23	5.36	19 23 48.6	140
21	3	50 57.12	50 54.74	20 29 6.8	28 56.7	9.57336	0.2003	4.17	5.41	20 23 53.6	141
22	3	59 59.33	59 58.86	21 6 17.9	6 16.0	9.57788	0.1784	4.09	5.46	21 23 58.8	142
23	4	9 6.64	9 8.15	21 41 30.3	41 35.9	9.58141	0.1528	3.97	5.50	22 0 4.0	143
24	4	18 17.84	18 21.36	22 14 33.3	14 45.5	9.58393	0.1232	3.79	5.53	24 0 9.2	144
25	4	27 31.56	27 37.15	22 45 17.0	45 34.8	9.58541	0.0893	+3.45	5.55	25 0 14.5	145
26	4	36 46.50	36 54.14	23 13 33.2	13 55.5	9.58579	0.0506	-2.72	5.57	26 0 19.8	146
27	4	46 1.24	46 10.91	23 39 15.1	39 40.7	9.58506	0.0063	3.59	5.58	27 0 25.1	147
28	4	55 14.36	55 26.02	24 2 17.8	2 45.3	9.58323	0.9656	3.86	5.59	28 0 30.4	148
29	5	4 24.47	4 38.06	24 22 37.8	23 5.9	9.58033	0.8972	4.02	5.60	29 0 35.7	149
30	5	13 30.27	13 45.69	24 40 13.5	40 41.0	9.57640	0.8994	4.12	5.60	30 0 40.9	150
31	5	22 30.53	22 47.67	24 55 4.9	55 30.6	9.57148	0.7494	4.20	5.59	31 0 46.0	151
June	1	5 31 24.11	31 42.84	25 7 13.5	7 36.3	9.56561	0.6528	4.27	5.58	1 0 50.9	152
2	5	40 9.97	40 30.16	25 16 42.0	17 1.0	9.55885	0.5313	4.32	5.57	2 0 55.8	153
3	5	48 47.21	49 8.72	25 23 34.5	23 48.6	9.55125	0.3676	4.36	5.56	3 1 0.5	154
4	5	57 15.00	57 37.67	25 27 55.6	28 4.0	9.54284	0.1142	4.39	5.54	4 1 5.0	155
5	6	5 32.61	5 56.30	25 29 51.1	29 53.1	9.53369	+8.4934	4.41	5.52	5 1 9.3	156
6	6	13 39.46	14 4.00	25 29 27.2	29 22.3	9.52334	-8.8019	4.43	5.50	6 1 13.5	157
7	6	21 35.00	22 0.24	25 26 50.3	26 38.2	9.51331	0.1853	4.45	5.48	7 1 17.5	158
8	6	29 18.78	29 44.58	25 22 7.5	21 47.9	9.50212	0.3768	4.46	5.46	8 1 21.3	159
9	6	36 50.42	37 16.64	25 15 25.9	14 58.7	9.49030	0.5026	4.47	5.43	9 1 24.9	160
10	6	44 9.62	44 36.12	25 6 52.7	6 17.8	9.47786	0.5946	4.48	5.40	10 1 28.2	161
11	6	51 16.11	51 42.74	24 56 34.9	55 52.4	9.46479	0.6658	4.49	5.37	11 1 31.4	162
12	6	58 9.66	58 36.29	24 44 39.8	43 49.8	9.45108	0.7228	4.50	5.34	12 1 34.3	163
13	7	4 50.07	5 16.57	24 31 14.6	30 17.3	9.43672	0.7697	4.51	5.30	13 1 37.0	164
14	7	11 17.15	11 43.40	24 16 26.3	15 22.0	9.42167	0.8086	4.51	5.26	14 1 39.5	165
15	7	17 30.74	17 56.63	23 60 21.8	59 10.9	9.40590	0.8414	4.51	5.22	15 1 41.8	166
16	7	23 30.71	23 56.13	23 43 8.1	41 51.1	9.38936	0.9691	4.51	5.17	16 1 43.9	167
17	7	29 16.89	29 41.74	23 24 51.9	23 29.3	9.37198	0.8925	4.51	5.12	17 1 45.7	168
18	7	34 49.14	35 13.32	23 5 39.8	4 12.0	9.35367	0.9124	4.52	5.07	18 1 47.3	169
19	7	40 7.32	40 30.73	22 45 38.1	44 5.7	9.33433	0.9292	4.53	5.01	19 1 48.6	170
20	7	45 11.26	45 33.82	22 24 53.3	23 16.9	9.31385	0.9431	4.53	4.94	20 1 49.7	171
21	7	50 0.78	50 22.41	22 3 31.7	1 52.0	9.29208	0.9645	4.54	4.86	21 1 50.6	172
22	7	54 35.71	54 56.33	21 41 39.7	39 57.4	9.26886	0.9636	4.54	4.76	22 1 51.2	173
23	7	58 55.86	59 15.39	21 19 23.5	17 39.2	9.24397	0.9705	4.55	4.64	23 1 51.6	174
24	8	3 0.99	3 19.36	20 56 49.2	55 3.6	9.21712	0.9753	4.56	4.46	24 1 51.7	175
25	8	6 50.85	7 8.00	20 34 3.0	32 16.9	9.18801	0.9781	4.57	-4.12	25 1 51.6	176
26	8	10 25.19	10 41.07	20 11 11.2	9 25.3	9.15624	0.9789	4.58	+3.16	26 1 51.2	177
27	8	13 43.73	13 58.29	19 48 20.0	46 35.0	9.12131	0.9776	4.58	4.21	27 1 50.5	178
28	8	16 46.17	16 59.38	19 25 35.5	23 52.2	9.08256	0.9744	4.59	4.50	28 1 49.6	179
29	8	19 32.21	19 44.02	19 3 4.1	1 23.2	9.03910	0.9692	4.60	4.67	29 1 48.4	180
30	8	22 1.48	22 11.88	18 40 52.2	39 14.4	8.98973	0.9617	4.61	4.80	30 1 46.9	181
31	8	24 13.64	24 22.61	+18 19 6.4	17 32.4	+8.93282	-0.9519	-4.62	+4.89	31 1 45.1	182

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient. of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sideral Date of Transit.						
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.								
July	d	h	m	s	m	s	+18	19	6	17	32.4	+8.93292	-9.9519	-4.62	+4.89	d	h	m	s	d
1	8	24	13.64	24	22.61	17 57 53.1	56	23.5	8.86594	9.9397	4.62	4.97	2	1	43.1	183				
2	8	26	8.36	26	15.89	17 37 18.7	35	54.1	8.78524	9.9248	4.63	5.04	3	1	40.8	184				
3	8	27	45.31	27	51.41	17 17 30.1	16	11.0	8.68405	9.9069	4.64	5.10	4	1	38.1	185				
4	8	29	4.16	29	8.86	16 58 34.0	57	21.0	8.54951	9.8855	4.65	5.16	5	1	35.2	186				
5	8	30	4.60	30	7.94	16 40 37.2	39	30.7	8.35057	9.8601	4.65	5.21	6	1	31.9	187				
6	8	30	46.39	30	48.41	16 23 46.3	22	46.6	+7.96761	9.8304	4.66	5.25	7	1	28.4	188				
7	8	31	9.31	31	10.10	16 8 7.8	7	15.2	-7.59099	9.7953	4.66	5.28	8	1	24.5	189				
8	8	31	13.26	31	12.90	15 53 48.2	53	2.8	8.23169	9.7537	4.66	5.31	9	1	20.3	190				
9	8	30	58.22	30	56.82	15 40 53.7	40	15.4	8.47803	9.7043	4.66	5.33	10	1	15.8	191				
10	8	30	24.30	30	21.99	15 29 29.9	28	58.7	8.63165	9.6446	4.65	5.35	11	1	10.9	192				
11	8	29	31.77	29	28.71	15 19 42.2	19	17.7	8.74185	9.5717	4.63	5.37	12	1	5.8	193				
12	8	28	21.10	28	17.45	15 11 35.1	11	16.9	8.82615	9.4794	4.60	5.39	13	1	0.4	194				
13	8	26	52.95	26	48.89	15 5 12.6	5	0.1	8.89274	9.3581	4.57	5.41	14	0	54.7	195				
14	8	25	8.22	25	3.93	15 0 37.5	0	30.1	8.94603	9.1841	4.53	5.42	15	0	48.8	196				
15	8	23	8.08	23	3.76	14 57 51.8	57	48.6	8.98862	8.8838	4.47	5.42	16	0	42.6	197				
16	8	20	53.97	20	49.81	14 56 56.3	56	56.3	9.02209	-6.4437	4.39	5.42	17	0	36.3	198				
17	8	18	27.60	18	23.78	14 57 50.3	57	52.5	9.04739	+8.8757	4.28	5.41	18	0	29.8	199				
18	8	15	51.00	15	47.68	15 0 32.0	0	35.4	9.06512	9.1723	4.12	5.40	19	0	23.1	200				
19	8	13	6.45	13	3.76	15 4 57.9	5	1.5	9.07553	9.3405	-3.71	5.38	20	0	16.4	201				
20	8	10	16.45	10	14.50	15 11 3.2	11	6.0	9.07867	9.4570	+2.70	5.35	21	0	9.6	202				
21	8	7	23.75	7	22.60	15 18 42.2	18	43.2	9.07441	9.5427	3.88	5.31	22	0	2.8	203				
22	8	4	31.26	4	30.93	15 27 47.7	27	46.1	9.06235	9.6088	4.17	5.27	22	23	56.0	204				
23	8	1	41.92	1	42.38	15 38 11.5	38	6.6	9.04174	9.6603	4.34	5.22	23	23	49.4	205				
24	7	58	58.77	58	59.94	15 49 44.3	49	35.7	9.01154	9.7007	4.46	5.15	24	23	42.9	206				
25	7	56	24.82	56	26.57	16 2 16.5	2	3.9	8.97009	9.7319	4.55	5.07	25	23	36.6	207				
26	7	54	2.95	54	5.12	16 15 37.7	15	21.0	8.91464	9.7555	4.62	4.96	26	23	30.6	208				
27	7	51	55.90	51	58.30	16 29 37.1	29	16.3	8.84060	9.7726	4.67	4.82	27	23	24.8	209				
28	7	50	6.23	50	8.66	16 44 3.9	43	39.2	8.73941	9.7836	4.71	4.59	28	23	19.4	210				
29	7	48	36.25	48	38.49	16 58 46.9	58	18.8	8.59284	9.7889	4.75	+4.08	29	23	14.4	211				
30	7	47	28.02	47	29.82	17 13 34.9	13	4.0	8.34848	9.7886	4.78	-4.17	30	23	9.7	212				
Aug. 1	7	46	43.30	46	44.44	17 28 16.8	27	43.7	-7.65622	9.7827	4.80	4.62	0	23	5.4	213				
2	7	46	30.04	46	29.25	17 42 41.3	42	6.8	+8.14559	9.7711	4.81	4.83	1	23	1.5	214				
3	7	47	3.63	47	1.62	17 56 37.4	56	2.3	8.51938	9.7534	4.82	4.98	2	22	58.1	215				
4	7	48	5.04	48	1.67	18 9 54.0	9	19.2	8.72045	9.7287	4.83	5.09	3	22	55.2	216				
5	7	49	34.68	49	29.85	18 22 19.9	21	46.4	8.85869	9.6957	4.83	5.17	4	22	52.7	217				
6	7	51	32.77	51	26.43	18 33 43.9	33	12.6	8.96377	9.6527	4.83	5.24	5	22	50.7	218				
7	7	53	59.32	53	51.45	18 43 54.6	43	26.6	9.04805	9.5964	4.83	5.31	6	22	49.2	219				
8	7	56	54.14	56	44.75	18 52 41.2	52	17.3	9.11791	9.5217	4.82	5.36	7	22	48.2	220				
9	8	0	16.83	0	5.97	18 59 52.7	59	33.6	9.17713	9.4190	4.81	5.40	8	22	47.6	221				
10	8	4	6.83	3	54.60	19 5 18.1	5	4.6	9.22802	9.2671	4.80	5.44	9	22	47.5	222				
11	8	8	23.36	8	9.88	19 8 46.7	8	39.4	9.27219	9.0015	4.78	5.48	10	22	47.8	223				
12	8	13	5.48	12	50.90	19 10 8.4	10	7.7	9.31077	+7.9280	4.76	5.51	11	22	48.6	224				
13	8	18	12.06	17	56.54	19 9 13.5	9	19.6	9.34452	-8.9500	4.74	5.54	12	22	49.7	225				
14	8	23	41.78	23	25.52	19 5 53.3	6	6.4	9.37405	9.2851	4.71	5.57	13	22	51.2	226				
15	8	29	33.16	29	16.37	19 0 0.2	0	20.2	9.39981	9.4789	4.68	5.59	14	22	53.1	227				
16	8	35	44.53	35	27.45	18 51 27.6	51	54.2	9.42214	9.6167	4.64	5.60	15	22	55.4	228				
17	8	42	14.08	41	56.93	18 40 10.8	40	43.5	9.44132	9.7233	4.59	5.61	16	22	57.9	229				
18	8	48	59.86	48	42.86	18 26 6.7	26	44.9	9.45760	9.8099	4.53	5.61	17	23	0.7	230				
19	8	55	59.81	55	43.18	18 9 14.0	9	56.9	9.47118	9.8821	4.46	5.61	18	23	3.8	231				
20	9	3	11.85	2	55.78	17 49 33.7	50	20.1	9.48227	9.9434	4.38	5.60	19	23	7.0	232				
21	9	10	33.86	10	18.52	17 27 8.5	27	57.4	9.49104	9.9959	4.28	5.59	20	23	10.4	233				
22	9	18	3.75	17	49.29	17 2 3.1	2	53.5	9.49767	0.0413	4.15	5.57	21	23	14.0	234				
23	9	25	39.51	25	26.05	16 34 23.8	35	14.7	9.50234	0.0806	3.98	5.54	22	23	17.6	235				
24	9	33	19.25	33	6.89	16 4 18.6	5	8.8	9.50524	0.1146	3.72	5.51	23	23	21.3	236				
25	9	41	1.20	40	50.01	15 31 56.4	32	44.9	9.50658	0.1441	+3.17	5.48	24	23	25.1	237				
26	9	48	43.78	48	33.80	14 57 27.3	58	13.2	9.50652	0.1697	-3.27	5.44	25	23	28.9	238				
27	9	56	25.61	56	16.86	14 21 1.8	21	44.3	9.50522	0.1918	3.68	5.40	26	23	32.7	239				
28	10	4	5.47	3	57.96	13 42 50.6	43	29.0	9.50286	0.2107	3.86	5.36	27	23	36.4	240				
29	10	11	42.34	11	36.06	13 3 4.7	3	38.3	9.49962	0.2269	3.96	5.31	28	23	40.1	241				
30	10	19	15.41	19	10.31	12 21 54.8	22	23.1	9.49564	0.2408	4.03	5.25	29	23	43.7	242				
31	10	26	44.01	26	40.06	+11 39 31.1	39	53.9	+9.49106	-0.2526	-4.08	-5.19	30	23	47.3	243				

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Coefficient of 1.		Log Coefficient of 2.		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
Sept. 1	h m s	m s		° ' "	' "						d h m	d
2	10 34 7.62	34 4.78		+10 56 3.5	56 20.5		+9.48600	-0.3625	-4.11	-5.12	0 23 50.7	244
3	10 41 25.88	41 24.10		10 11 41.0	11 52.1		9.48057	0.2708	4.13	5.04	1 23 54.1	245
4	10 48 38.54	48 37.76		9 26 32.5	26 37.5		9.47487	0.2775	4.14	4.96	2 23 57.4	246
5	10 55 45.45	55 45.61		8 40 45.8	40 44.8		9.46898	0.2829	4.15	4.87	3 0 0.6	247
6	11 2 46.55	2 47.60		7 54 28.2	54 21.5		9.46298	0.2872	4.15	4.76	4 0 3.6	248
7	11 9 41.82	9 43.72		7 7 46.4	7 33.5		9.45692	0.2905	4.14	4.63	5 0 6.6	249
8	11 16 31.34	16 34.03		6 20 46.6	20 28.0		9.45087	0.2928	4.13	4.47	6 0 9.5	250
9	11 23 15.22	23 18.65		5 33 34.3	33 10.1		9.44487	0.2943	4.12	4.26	7 0 12.3	251
10	11 29 53.59	29 57.71		4 46 14.4	45 44.8		9.43896	0.2951	4.11	-3.84	8 0 15.0	252
11	11 36 26.62	36 31.39		3 58 51.5	58 16.7		9.43317	0.2953	4.10	+3.42	9 0 17.6	253
12	11 42 54.50	42 59.89		3 11 29.7	10 50.0		9.42752	0.2949	4.08	4.07	10 0 20.1	254
13	11 49 17.44	49 23.41		2 24 12.8	23 28.4		9.42203	0.2939	4.06	4.29	11 0 22.6	255
14	11 55 35.64	55 42.15		1 37 4.0	36 15.1		9.41670	0.2924	4.04	4.43	12 0 24.9	256
15	12 1 49.31	1 56.33		0 50 6.4	49 13.2		9.41157	0.2904	4.02	4.53	13 0 27.2	257
16	12 7 58.67	8 6.18		0 3 22.8	2 25.5		9.40664	0.2880	4.00	4.60	14 0 29.5	258
17	12 14 3.95	14 11.92		0 43 4.4	44 5.4		9.40191	0.2853	3.98	4.66	15 0 31.6	259
18	12 20 5.34	20 13.75		1 29 12.7	30 17.2		9.39737	0.2823	3.96	4.70	16 0 33.7	260
19	12 26 3.06	26 11.89		2 15 0.1	16 7.9		9.39304	0.2788	3.92	4.74	17 0 35.7	261
20	12 31 57.33	32 6.55		3 0 24.8	1 35.7		9.38891	0.2749	3.89	4.77	18 0 37.7	262
21	12 37 48.31	37 57.91		3 45 24.6	46 38.4		9.38495	0.2707	3.86	4.80	19 0 39.6	263
22	12 43 36.17	43 46.13		4 29 57.8	31 14.3		9.38117	0.2663	3.84	4.83	20 0 41.4	264
23	12 49 21.09	49 31.40		5 14 2.8	15 21.8		9.37759	0.2616	3.82	4.85	21 0 43.2	265
24	12 55 3.27	55 13.92		5 57 38.2	58 59.4		9.37419	0.2566	3.79	4.87	22 0 45.0	266
25	13 0 42.85	0 53.82		6 40 42.6	42 5.8		9.37094	0.2512	3.77	4.89	23 0 46.7	267
26	13 6 19.94	6 31.22		7 23 14.5	24 39.6		9.36782	0.2455	3.75	4.91	24 0 48.4	268
27	13 11 54.66	12 6.25		8 5 12.4	6 39.2		9.36483	0.2395	3.73	4.92	25 0 50.0	269
28	13 17 27.13	17 39.01		8 46 35.0	48 3.3		9.36195	0.2332	3.71	4.94	26 0 51.6	270
29	13 22 57.45	23 9.61		9 27 20.9	28 50.5		9.35918	0.2266	3.70	4.96	27 0 53.2	271
30	13 28 25.71	28 38.14		10 7 28.7	8 59.4		9.35648	0.2196	3.69	4.97	28 0 54.7	272
Oct. 1	13 33 51.95	34 4.65		10 46 57.0	48 28.7		9.35382	0.2123	3.68	4.99	29 0 56.2	273
2	13 39 16.21	39 29.17		11 25 44.7	27 17.1		9.35119	0.2045	3.67	5.00	1 0 57.7	274
3	13 44 38.53	44 51.72		12 3 50.1	5 23.0		9.34855	0.1963	3.67	5.02	2 0 59.1	275
4	13 49 58.88	50 12.30		12 41 11.7	42 44.9		9.34587	0.1877	3.68	5.03	3 1 0.5	276
5	13 55 17.24	55 30.88		13 17 48.2	19 21.5		9.34313	0.1786	3.69	5.05	4 1 1.9	277
6	14 0 33.59	0 47.43		13 53 38.0	55 11.2		9.34029	0.1690	3.71	5.06	5 1 3.2	278
7	14 5 47.83	6 1.85		14 28 39.4	30 12.3		9.33730	0.1589	3.73	5.08	6 1 4.5	279
8	14 10 59.84	11 14.03		15 2 50.7	4 23.1		9.33412	0.1481	3.75	5.09	7 1 5.7	280
9	14 16 9.49	16 23.83		15 36 10.2	37 41.8		9.33067	0.1366	3.78	5.11	8 1 6.9	281
10	14 21 16.61	21 31.07		16 8 36.0	10 6.6		9.32691	0.1243	3.82	5.12	9 1 8.1	282
11	14 26 20.97	26 35.53		16 40 6.1	41 35.5		9.32279	0.1112	3.86	5.14	10 1 9.3	283
12	14 31 22.31	31 36.95		17 10 38.4	12 6.3		9.31822	0.0973	3.90	5.16	11 1 10.4	284
13	14 36 20.32	36 35.00		17 40 10.8	41 36.9		9.31309	0.0823	3.95	5.18	12 1 11.4	285
14	14 41 14.62	41 29.29		18 8 40.7	10 4.8		9.30730	0.0661	4.00	5.20	13 1 12.3	286
15	14 46 4.79	46 19.41		18 36 5.6	37 27.4		9.30073	0.0486	4.05	5.22	14 1 13.2	287
16	14 50 50.33	51 4.86		19 2 22.8	3 41.9		9.29324	0.0295	4.10	5.23	15 1 14.0	288
17	14 55 30.67	55 45.06		19 27 29.4	28 45.5		9.28465	0.0086	4.15	5.25	16 1 14.8	289
18	15 0 5.13	0 19.32		19 51 22.1	52 34.9		9.27472	0.9856	4.20	5.27	17 1 15.4	290
19	15 4 32.95	4 46.86		20 13 57.3	15 6.5		9.26324	0.9602	4.25	5.29	18 1 15.9	291
20	15 8 53.28	9 6.83		20 35 11.4	36 16.4		9.24989	0.9317	4.30	5.31	19 1 16.3	292
21	15 13 5.12	13 18.23		20 54 59.7	56 0.4		9.23427	0.8995	4.35	5.33	20 1 16.5	293
22	15 17 7.36	17 19.94		21 13 18.1	14 13.9		9.21588	0.8628	4.41	5.35	21 1 16.6	294
23	15 20 58.73	21 10.68		21 30 1.3	30 51.8		9.19409	0.8204	4.47	5.38	22 1 16.5	295
24	15 24 37.83	24 49.04		21 45 3.8	45 48.6		9.16810	0.7702	4.52	5.41	23 1 16.2	296
25	15 28 3.06	28 13.41		21 58 19.4	58 58.1		9.13676	0.7096	4.57	5.44	24 1 15.7	297
26	15 31 12.64	31 22.01		22 9 40.9	10 13.0		9.09853	0.6339	4.62	5.47	25 1 14.9	298
27	15 34 4.63	34 12.90		22 19 0.6	19 25.7		9.05115	0.5352	4.67	5.50	26 1 13.8	299
28	15 36 36.87	36 43.93		22 26 10.1	26 27.9		8.99112	0.3963	4.72	5.53	27 1 12.4	300
29	15 38 47.05	38 52.79		22 30 59.5	31 9.7		8.91270	0.1706	4.77	5.56	28 1 10.6	301
30	15 40 32.69	40 37.02		22 33 18.3	33 20.7		8.80504	-8.5956	4.81	5.59	29 1 8.4	302
31	15 41 51.17	41 54.03		22 32 54.6	32 49.3		8.64384	+8.8907	4.85	5.62	30 1 5.7	303
32	15 42 39.82	42 41.19		22 29 36.0	29 23.0		+8.35044	9.3093	4.89	5.66	31 1 2.6	304
33	15 42 56.05	42 55.95		-22 23 9.0	22 48.8		-6.96152	+9.5309	-4.92	+5.69	32 0 58.9	305

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t.		Log Coefficient of t².		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
	d h m s	m s	° ' "	° ' "					d h m	d
Nov. 1	15 42 56.06	42 56.95	22 23 9.0	22 48.8	-6.98152	+9.5309	-4.92	+5.69	1 0 58.9	305
2	15 42 37.38	42 35.93	22 13 19.9	12 53.3	8.41352	9.6854	4.94	5.72	2 0 54.6	306
3	15 41 41.74	41 39.12	21 59 55.2	59 23.3	8.71693	9.8051	4.96	5.74	3 0 49.7	307
4	15 40 7.62	40 4.10	21 42 42.9	42 7.4	8.89789	9.9029	4.97	5.75	4 0 44.2	308
5	15 37 54.39	37 50.33	21 21 33.9	20 57.0	9.02540	9.9847	4.97	5.76	5 0 38.1	309
6	15 35 2.57	34 58.42	20 56 24.1	55 48.6	9.19097	0.0537	4.95	5.76	6 0 31.3	310
7	15 31 34.14	31 30.39	20 27 16.5	26 45.6	9.19387	0.1113	4.90	5.73	7 0 23.9	311
8	15 27 32.74	27 29.91	19 54 24.0	54 1.0	9.24856	0.1582	4.82	5.68	8 0 16.0	312
9	15 23 3.87	23 2.39	19 18 12.0	18 0.1	9.28736	0.1944	4.69	5.59	9 0 7.6	313
10	15 18 14.73	18 14.95	18 39 19.2	39 21.0	9.31141	0.2196	4.44	5.42	9 23 58.9	314
11	15 13 14.04	13 16.13	17 58 37.8	58 54.9	9.32113	0.2333	-3.65	+5.03	10 23 50.0	315
12	15 8 11.47	8 15.39	17 17 11.4	17 43.9	9.31654	0.2349	+4.29	-4.80	11 23 41.1	316
13	15 3 17.06	3 22.56	16 36 11.3	36 57.8	9.29715	0.2237	4.63	5.38	12 23 32.3	317
14	14 58 40.48	58 47.12	15 56 50.7	57 48.1	9.26203	0.1987	4.80	5.61	13 23 23.7	318
15	14 54 30.35	54 37.55	15 20 18.8	21 22.8	9.20945	0.1590	4.91	5.74	14 23 15.6	319
16	14 50 53.75	51 0.88	14 47 35.6	48 41.4	9.13627	0.1028	4.97	5.82	15 23 8.1	320
17	14 47 55.92	48 2.35	14 19 27.5	20 30.3	9.03657	0.0273	5.00	5.87	16 23 1.3	321
18	14 45 40.13	45 45.30	13 56 26.1	57 21.4	8.89793	9.9276	5.02	5.89	17 22 55.0	322
19	14 44 7.89	44 11.38	13 38 47.3	39 31.4	8.68863	9.7936	5.02	5.89	18 22 49.6	323
20	14 43 19.16	43 20.64	13 26 33.2	27 3.6	-8.27994	9.6013	5.01	5.87	19 22 44.8	324
21	14 43 12.65	43 11.94	13 19 34.7	19 49.9	+7.97947	+9.2699	4.98	5.85	20 22 40.7	325
22	14 43 46.25	43 43.29	13 17 34.3	17 33.7	8.56156	-8.1064	4.95	5.82	21 22 37.3	326
23	14 44 57.21	44 52.02	13 20 8.8	19 52.6	8.78771	9.2886	4.91	5.78	22 22 34.5	327
24	14 46 42.52	46 35.19	13 26 51.5	26 20.6	8.92474	9.5525	4.87	5.73	23 22 32.3	328
25	14 48 59.03	48 49.72	13 37 14.1	36 29.8	9.01984	9.6088	4.83	5.67	24 22 30.6	329
26	14 51 43.64	51 32.53	13 50 48.4	49 52.3	9.09047	9.7948	4.78	5.60	25 22 29.4	330
27	14 54 53.40	54 40.68	14 7 7.2	6 1.0	9.14508	9.8625	4.73	5.52	26 22 28.6	331
28	14 58 25.56	58 11.42	14 25 45.0	24 30.3	9.18848	9.9122	4.67	5.44	27 22 28.1	332
29	15 2 17.61	2 2.25	14 46 18.1	44 56.5	9.22367	9.9491	4.62	5.35	28 22 28.0	333
30	15 6 27.30	6 10.91	15 8 25.0	6 58.1	9.25262	9.9767	4.57	5.25	29 22 28.2	334
Dec. 1	15 10 52.59	10 35.35	15 31 46.3	30 15.7	9.27675	9.9971	4.52	5.13	0 22 28.7	335
2	15 15 31.72	15 13.79	15 56 5.0	54 32.0	9.29708	0.0119	4.47	5.00	1 22 29.4	336
3	15 20 23.14	20 4.66	16 21 5.5	19 31.2	9.31439	0.0220	4.42	4.83	2 22 30.3	337
4	15 25 25.49	25 6.59	16 46 34.2	44 59.6	9.32923	0.0284	4.37	4.60	3 22 31.4	338
5	15 30 37.59	30 18.39	17 12 19.4	10 45.4	9.34209	0.0316	4.32	-4.15	4 22 32.6	339
6	15 35 58.42	35 39.03	17 38 10.6	36 38.0	9.35331	0.0319	4.27	+3.92	5 22 34.0	340
7	15 41 27.11	41 7.63	18 3 58.4	2 28.0	9.36318	0.0296	4.23	4.44	6 22 35.5	341
8	15 47 2.88	46 43.40	18 29 34.8	28 7.0	9.37192	0.0256	4.19	4.65	7 22 37.2	342
9	15 52 45.09	52 25.63	18 54 52.6	53 27.9	9.37973	0.0193	4.15	4.78	8 22 39.0	343
10	15 58 33.17	58 13.89	19 19 45.3	18 24.1	9.38675	0.0111	4.11	4.87	9 22 40.8	344
11	16 4 26.63	4 7.55	19 44 7.3	42 49.9	9.39310	0.0012	4.07	4.93	10 22 42.8	345
12	16 10 25.06	10 6.23	20 7 53.9	6 40.5	9.39889	9.9897	4.04	4.98	11 22 44.8	346
13	16 16 23.09	16 9.56	20 31 0.4	29 51.2	9.40421	9.9765	4.01	5.02	12 22 46.9	347
14	16 22 35.41	22 17.22	20 53 22.8	52 17.9	9.40912	9.9616	3.96	5.06	13 22 49.1	348
15	16 28 46.74	28 28.94	21 14 57.5	13 57.0	9.41368	9.9451	3.95	5.09	14 22 51.3	349
16	16 35 1.86	34 44.49	21 35 41.2	34 45.2	9.41793	9.9268	3.93	5.11	15 22 53.6	350
17	16 41 20.55	41 3.64	21 55 31.0	54 39.4	9.42192	9.9066	3.91	5.13	16 22 56.0	351
18	16 47 42.62	47 26.21	22 14 24.2	13 37.0	9.42566	9.8843	3.89	5.15	17 22 58.4	352
19	16 54 7.90	53 52.02	22 32 18.2	31 35.4	9.42919	9.8599	3.87	5.17	18 23 0.9	353
20	17 0 36.23	0 20.92	22 49 10.7	48 32.2	9.43253	9.8330	3.85	5.19	19 23 3.4	354
21	17 7 7.50	6 52.78	23 4 59.7	4 25.4	9.43571	9.8034	3.83	5.20	20 23 6.0	355
22	17 13 41.57	13 27.47	23 19 43.1	19 12.8	9.43873	9.7706	3.81	5.21	21 23 8.6	356
23	17 20 18.32	20 4.86	23 33 18.9	32 52.5	9.44160	9.7341	3.79	5.22	22 23 11.3	357
24	17 26 57.64	26 44.85	23 45 45.3	45 22.6	9.44433	9.6931	3.77	5.23	23 23 14.0	358
25	17 33 39.42	33 27.33	23 57 0.6	56 41.4	9.44693	9.6468	3.75	5.24	24 23 16.8	359
26	17 40 23.55	40 12.18	24 7 3.4	6 47.5	9.44941	9.5938	3.73	5.25	25 23 19.6	360
27	17 47 9.94	46 59.31	24 15 52.1	15 39.3	9.45176	9.5320	3.71	5.26	26 23 22.4	361
28	17 53 58.48	53 48.61	24 23 25.1	23 15.2	9.45400	9.4585	3.69	5.27	27 23 25.3	362
29	18 0 49.08	0 39.99	24 29 41.1	29 33.7	9.45612	9.3682	3.67	5.28	28 23 28.2	363
30	18 7 41.63	7 33.35	24 34 38.6	34 33.5	9.45812	9.2517	3.65	5.28	29 23 31.2	364
31	18 14 36.04	14 28.58	24 38 16.5	38 13.4	9.46001	9.0889	3.62	5.29	30 23 34.1	365
32	18 21 32.90	21 25.58	24 40 33.4	40 31.9	+9.46178	-8.8198	+3.59	+5.29	31 23 37.1	366

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.				Apparent Declination.				Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.				
	At Mean Noon.		At Transit.		At Mean Noon.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.						
Jan.	d	h	m	s	m	s	°	'	°	'			d	h	m	s		
	1	16	33	21.95	32	53.34	-20	31	35.0	30	22.8	+9.33561	-9.7380	+3.37	+4.93	0	21	47.9
	2	16	38	34.30	38	5.88	20	44	25.3	43	16.8	9.33695	9.7185	3.36	4.93	1	21	49.2
	3	16	43	47.61	43	19.39	20	56	40.8	55	36.1	9.33831	9.6979	3.36	4.94	2	21	50.5
	4	16	49	1.89	48	33.87	21	8	21.0	7	20.1	9.33963	9.6757	3.33	4.94	3	21	51.8
	5	16	54	17.11	53	49.29	21	19	25.2	18	28.2	9.34091	9.6519	3.31	4.95	4	21	53.1
	6	16	59	33.23	59	5.62	21	29	52.8	28	59.6	9.34211	9.6265	3.29	4.95	5	21	54.4
	7	17	4	50.20	4	22.82	21	39	43.4	38	54.0	9.34324	9.5991	3.26	4.96	6	21	55.8
	8	17	10	7.98	9	40.82	21	48	56.6	48	11.0	9.34434	9.5696	3.21	4.96	7	21	57.1
	9	17	15	26.52	14	59.59	21	57	32.0	56	50.0	9.34528	9.5376	3.20	4.96	8	21	58.5
	10	17	20	45.74	20	19.06	22	5	29.1	4	50.7	9.34622	9.5024	3.16	4.97	9	21	59.8
	11	17	26	5.62	25	39.20	22	12	47.3	12	12.6	9.34707	9.4636	3.13	4.98	10	22	1.2
	12	17	31	26.10	30	50.95	22	19	26.4	18	55.3	9.34789	9.4207	3.06	4.98	11	22	2.6
	13	17	36	47.16	36	21.27	22	25	25.9	24	58.4	9.34863	9.3725	3.03	4.98	12	22	4.0
	14	17	42	08.74	41	43.12	22	30	45.5	30	21.6	9.34923	9.3183	2.99	4.99	13	22	5.4
	15	17	47	30.77	47	5.43	22	35	25.2	35	4.7	9.34979	9.2557	2.93	5.00	14	22	6.8
	16	17	52	53.17	52	28.13	22	39	24.4	39	7.3	9.35033	9.1815	2.83	5.00	15	22	8.2
	17	17	58	15.93	57	51.19	22	42	42.8	42	29.1	9.35076	9.0926	2.72	5.00	16	22	9.7
	18	18	3	38.98	3	14.54	22	45	20.5	45	10.0	9.35111	8.9793	2.59	5.00	17	22	11.1
	19	18	9	2.26	8	38.14	22	47	17.2	47	9.9	9.35135	8.8244	2.46	5.00	18	22	12.6
	20	18	14	25.70	14	1.91	22	48	32.7	48	28.6	9.35155	8.5820	1.99	5.00	19	22	14.1
	21	18	19	49.26	19	25.78	22	49	7.0	49	5.9	9.35165	-7.9752	+1.88	5.00	20	22	15.5
	22	18	25	12.87	24	49.72	22	48	59.9	49	1.8	9.35172	+8.2888	-1.99	5.00	21	22	17.0
	23	18	30	36.50	30	13.67	22	48	11.3	48	16.1	9.35169	8.6818	2.38	5.00	22	22	18.4
	24	18	36	0.08	35	37.57	22	46	41.4	46	49.0	9.35157	8.8854	2.53	5.00	23	22	19.8
25	18	41	23.55	41	1.38	22	44	30.1	44	40.4	9.35141	9.0235	2.68	5.00	24	22	21.3	
26	18	46	46.87	46	25.05	22	41	37.4	41	50.4	9.35117	9.1283	2.81	5.00	25	22	22.8	
27	18	52	9.98	51	48.51	22	38	3.3	38	18.8	9.35084	9.2123	2.89	5.00	26	22	24.2	
28	18	57	32.82	57	11.69	22	33	47.9	34	5.9	9.35045	9.2829	2.96	5.00	27	22	25.7	
29	19	2	55.34	2	34.55	22	28	51.3	29	11.7	9.34997	9.3428	3.01	5.00	28	22	27.1	
30	19	8	17.48	7	57.02	22	23	13.9	23	36.5	9.34944	9.3852	3.06	5.00	29	22	28.5	
Feb.	31	19	13	39.20	13	19.08	22	16	55.9	17	20.7	9.34881	9.4421	3.10	4.99	30	22	29.9
	1	19	19	0.43	18	40.67	22	9	57.3	10	24.2	9.34813	9.4841	3.14	4.98	31	22	31.4
	2	19	24	21.13	24	1.71	22	2	18.4	2	47.3	9.34736	9.5220	3.18	4.98	32	22	32.7
	3	19	29	41.24	29	22.16	21	53	59.6	54	30.4	9.34655	9.5567	3.21	4.97	33	22	34.1
	4	19	35	0.72	34	41.99	21	45	1.1	45	33.8	9.34565	9.5886	3.23	4.97	34	22	35.5
	5	19	40	19.52	40	1.14	21	35	23.3	35	57.7	9.34469	9.6179	3.26	4.97	35	22	36.9
	6	19	45	37.60	45	19.57	21	25	6.6	25	42.6	9.34369	9.6453	3.30	4.96	36	22	38.3
	7	19	50	54.92	50	37.23	21	14	11.3	14	48.9	9.34260	9.6707	3.32	4.96	37	22	39.6
	8	19	56	11.42	55	54.08	21	2	38.0	3	17.0	9.34144	9.6942	3.33	4.95	38	22	41.0
	9	20	1	27.06	1	10.05	20	50	27.3	51	7.7	9.34025	9.7162	3.35	4.95	39	22	42.3
	10	20	6	41.82	6	25.14	20	37	39.6	38	21.3	9.33900	9.7373	3.36	4.94	40	22	43.6
	11	20	11	55.65	11	39.30	20	24	14.9	24	57.8	9.33768	9.7573	3.37	4.93	41	22	44.9
	12	20	17	8.52	16	52.51	20	10	13.8	10	57.8	9.33634	9.7757	3.38	4.92	42	22	46.2
	13	20	22	20.41	22	4.72	19	55	37.3	56	22.3	9.33496	9.7930	3.40	4.91	43	22	47.4
	14	20	27	31.29	27	15.92	19	40	26.1	41	12.1	9.33351	9.8095	3.40	4.91	44	22	48.7
	15	20	32	41.13	32	26.07	19	24	40.6	25	27.4	9.33206	9.8252	3.41	4.91	45	22	49.9
16	20	37	49.92	37	35.17	19	8	21.2	9	8.8	9.33054	9.8400	3.41	4.90	46	22	51.1	
17	20	42	57.63	42	43.19	18	51	28.6	52	16.9	9.32902	9.8542	3.42	4.89	47	22	52.3	
18	20	48	4.25	47	50.11	18	34	3.2	34	52.2	9.32746	9.8676	3.43	4.88	48	22	53.5	
19	20	53	9.76	52	55.91	18	16	5.8	16	55.4	9.32587	9.8804	3.43	4.87	49	22	54.6	
20	20	58	14.15	58	0.58	17	57	37.0	58	27.2	9.32428	9.8927	3.44	4.86	50	22	55.7	
21	21	3	17.42	3	4.14	17	38	37.3	39	27.9	9.32265	9.9043	3.44	4.85	51	22	56.9	
22	21	8	19.55	8	6.57	17	19	7.4	19	58.4	9.32100	9.9153	3.43	4.84	52	22	58.0	
23	21	13	20.54	13	7.83	16	59	8.2	59	59.6	9.31937	9.9258	3.43	4.82	53	22	59.0	
24	21	18	20.41	18	7.96	16	38	40.4	39	32.0	9.31776	9.9358	3.42	4.81	54	23	0.1	
25	21	23	19.17	23	6.97	16	17	44.6	18	36.5	9.31616	9.9454	3.43	4.81	55	23	1.1	
26	21	28	16.82	28	4.83	15	56	21.3	57	13.6	9.31453	9.9547	3.43	4.80	56	23	1.9	
27	21	33	13.35	33	1.56	15	34	31.0	35	23.8	9.31284	9.9634	3.42	4.79	57	23	2.7	
28	21	38	8.75	37	57.16	15	12	14.8	13	7.8	9.31123	9.9718	3.41	4.77	58	23	3.4	
29	21	43	3.06	42	51.68	14	49	33.1	50	26.3	9.30964	9.9797	3.41	4.76	59	23	4.2	
30	21	47	56.30	47	45.16	14	26	26.9	27	20.1	9.30806	9.9873	3.40	4.75	60	23	5.2	
31	21	52	48.48	52	37.67	-14	2	56.7	3	49.8	+9.30650	+9.9946	-3.40	+4.73	61	23	6.3	

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side-Real Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
Mar. 1	d h m s	m s	° ' "	' "					d h m	d
1	21 43 3.06	42 51.68	-14 49 33.1	50 26.3	+9.30964	+9.9797	-3.41	+4.76	59 23 4.2	59
2	21 47 56.30	47 45.16	14 26 26.9	27 20.1	9.30806	9.9873	3.40	4.75	60 23 5.2	60
3	21 52 48.48	52 37.60	14 2 56.7	3 49.8	9.30650	9.9946	3.40	4.73	61 23 6.3	61
4	21 57 39.61	57 28.99	13 39 3.3	39 56.1	9.30494	0.0015	3.40	4.71	62 23 7.4	62
5	22 2 29.69	2 19.33	13 14 47.6	15 40.1	9.30336	0.0080	3.38	4.69	63 23 8.5	63
6	22 7 18.73	7 8.62	12 50 10.6	51 2.7	9.30182	0.0140	3.36	4.70	64 23 9.6	64
7	22 12 6.76	11 56.87	12 25 12.8	26 4.6	9.30035	0.0202	3.36	4.68	65 23 10.5	65
8	22 16 53.83	16 44.14	11 59 54.5	60 46.1	9.29889	0.0260	3.36	4.65	66 23 11.4	66
9	22 21 39.93	21 30.45	11 34 16.5	35 7.9	9.29741	0.0314	3.36	4.62	67 23 12.2	67
10	22 26 25.07	26 15.78	11 8 19.8	9 10.9	9.29594	0.0364	3.33	4.61	68 23 13.0	68
11	22 31 9.27	31 0.17	10 42 5.3	42 56.1	9.29456	0.0412	3.32	4.60	69 23 13.8	69
12	22 35 52.58	35 43.66	10 15 33.8	16 24.3	9.29321	0.0458	3.31	4.57	70 23 14.6	70
13	22 40 35.02	40 26.29	9 48 45.9	49 36.0	9.29187	0.0501	3.29	4.56	71 23 15.6	71
14	22 45 16.61	45 8.05	9 21 42.4	22 32.1	9.29059	0.0541	3.26	4.55	72 23 16.1	72
15	22 49 57.39	49 48.98	8 54 24.0	55 13.4	9.28939	0.0581	3.25	4.53	73 23 16.8	73
16	22 54 37.40	54 29.15	8 26 51.0	27 40.1	9.28821	0.0619	3.25	4.48	74 23 17.5	74
17	22 59 16.66	59 8.57	7 59 4.1	59 52.8	9.28703	0.0653	3.19	4.46	75 23 18.2	75
18	23 3 55.18	3 47.24	7 31 4.3	31 52.4	9.28593	0.0685	3.19	4.44	76 23 18.9	76
19	23 8 33.02	8 25.23	7 2 52.8	3 40.1	9.28490	0.0714	3.18	4.41	77 23 19.6	77
20	23 13 10.21	13 2.58	6 34 30.1	35 16.9	9.28390	0.0743	3.13	4.37	78 23 20.3	78
21	23 17 46.78	17 39.30	6 5 56.7	6 43.3	9.28299	0.0768	3.11	4.34	79 23 21.0	79
22	23 22 22.79	22 15.44	5 37 13.5	37 59.7	9.28209	0.0792	3.08	4.32	80 23 21.6	80
23	23 26 58.25	26 51.05	5 8 21.2	9 6.7	9.28127	0.0815	3.04	4.27	81 23 22.3	81
24	23 31 33.21	31 26.15	4 39 20.2	40 5.2	9.28051	0.0835	2.99	4.22	82 23 22.9	82
25	23 36 7.70	36 0.77	4 10 11.4	10 55.8	9.27983	0.0853	2.96	4.15	83 23 23.6	83
26	23 40 41.79	40 34.98	3 40 55.6	41 39.3	9.27920	0.0870	2.91	4.13	84 23 24.2	84
27	23 45 15.50	45 8.81	3 11 33.4	12 16.5	9.27861	0.0885	2.83	4.08	85 23 24.8	85
28	23 49 48.87	49 42.31	2 42 5.5	42 48.1	9.27812	0.0898	2.76	4.01	86 23 25.4	86
29	23 54 21.95	54 15.51	2 12 32.6	13 14.6	9.27769	0.0910	2.68	3.88	87 23 26.0	87
30	23 58 54.78	58 48.45	1 42 55.4	43 36.7	9.27734	0.0919	2.64	3.86	88 23 26.6	88
31	0 3 27.40	3 21.19	1 13 14.8	13 55.3	9.27702	0.0926	2.46	3.76	89 23 27.2	90
Apr. 1	0 7 59.84	7 53.75	0 43 31.4	44 11.2	9.27677	0.0933	2.16	3.53	90 23 27.8	91
2	0 12 32.16	12 26.18	0 13 45.6	14 24.8	9.27664	0.0937	2.16	+3.16	91 23 28.4	92
3	0 17 4.41	16 58.54	0 16 1.6	15 23.1	9.27654	0.0940	-1.68	-2.38	92 23 29.0	93
4	0 21 36.61	21 30.86	0 45 49.4	45 11.7	9.27646	0.0940	+1.99	2.99	93 23 29.6	94
5	0 26 8.79	26 3.16	1 15 37.2	15 0.2	9.27651	0.0940	2.16	3.47	94 23 30.1	95
6	0 30 41.02	30 35.48	1 45 24.4	44 48.0	9.27659	0.0938	2.38	3.76	95 23 30.7	96
7	0 35 13.31	35 7.88	2 15 10.4	14 34.6	9.27670	0.0933	2.59	3.86	96 23 31.3	97
8	0 39 45.70	39 40.38	2 44 53.8	44 19.0	9.27691	0.0923	2.72	3.88	97 23 31.9	98
9	0 44 18.25	44 13.04	3 14 34.1	14 0.2	9.27723	0.0912	2.81	3.99	98 23 32.5	99
10	0 48 51.02	48 45.92	3 44 10.9	43 37.7	9.27760	0.0905	2.76	4.09	99 23 33.1	100
11	0 53 24.01	53 19.02	4 13 43.6	13 11.0	9.27793	0.0897	2.86	4.16	100 23 33.7	101
12	0 57 57.24	57 52.38	4 43 11.1	42 39.5	9.27838	0.0884	2.93	4.19	101 23 34.3	102
13	1 2 30.78	2 26.03	5 12 32.7	12 2.1	9.27896	0.0868	2.93	4.25	102 23 35.0	103
14	1 7 4.69	7 0.04	5 41 47.6	41 18.0	9.27960	0.0851	3.01	4.26	103 23 35.6	104
15	1 11 38.97	11 34.45	6 10 55.2	10 26.5	9.28015	0.0832	3.04	4.32	104 23 36.3	105
16	1 16 13.68	16 9.27	6 39 54.9	39 27.1	9.28085	0.0811	3.08	4.35	105 23 36.9	106
17	1 20 48.85	20 44.55	7 8 46.0	8 19.0	9.28160	0.0789	3.11	4.38	106 23 37.5	107
18	1 25 24.52	25 20.34	7 37 27.8	37 1.8	9.28244	0.0765	3.13	4.42	107 23 38.2	108
19	1 30 0.73	29 56.68	8 5 59.5	5 34.5	9.28330	0.0738	3.16	4.45	108 23 38.9	109
20	1 34 37.51	34 33.59	8 34 20.2	33 56.2	9.28421	0.0708	3.20	4.47	109 23 39.6	110
21	1 39 14.90	39 11.10	9 2 29.2	2 6.2	9.28523	0.0678	3.21	4.50	110 23 40.3	111
22	1 43 52.95	43 49.26	9 30 25.9	30 3.9	9.28628	0.0645	3.22	4.52	111 23 41.0	112
23	1 48 31.67	48 28.11	9 58 9.8	57 48.6	9.28734	0.0611	3.28	4.54	112 23 41.6	113
24	1 53 11.10	53 7.67	10 25 40.0	25 19.7	9.28850	0.0574	3.29	4.56	113 23 42.3	114
25	1 57 51.31	57 48.00	10 52 55.7	52 36.5	9.28972	0.0534	3.29	4.59	114 23 43.0	115
26	2 2 32.32	2 29.14	11 19 56.1	19 38.0	9.29096	0.0492	3.31	4.60	115 23 43.8	116
27	2 7 14.14	7 11.10	11 46 40.7	46 23.6	9.29225	0.0449	3.34	4.61	116 23 44.5	117
28	2 11 56.81	11 53.92	12 13 8.8	12 52.7	9.29360	0.0403	3.36	4.64	117 23 45.3	118
29	2 16 40.39	16 37.65	12 39 19.7	39 4.6	9.29503	0.0354	3.34	4.66	118 23 46.1	119
30	2 21 24.91	21 22.32	13 5 12.5	4 58.5	9.29641	0.0302	3.36	4.68	119 23 46.9	120
31	2 26 10.33	26 7.89	+13 30 46.4	30 33.4	+9.29778	+0.0247	+3.39	-4.68	120 23 47.7	121

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.
	Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
d	h m s	m s		° ' "	° ' "						d h m	d
May 1	2 26 10.33	26 7.89		+13 30' 46.4	30' 33.4		+9.29778	+0.0247	+3.39	-4.68	120 23 47.7	121
2	2 30 56.69	30 54.40		13 56' 0.7	55 48.7		9.29934	0.0191	3.39	4.69	121 23 48.5	122
3	2 35 44.08	35 41.94		14 20 54.9	20 43.9		9.30091	0.0131	3.38	4.72	122 23 49.4	123
4	2 40 32.50	40 30.53		14 45 28.0	45 18.1		9.30242	0.0068	3.38	4.73	123 23 50.3	124
5	2 45 21.92	45 20.15		15 9 39.3	9 30.5		9.30393	0.0001	3.37	4.75	124 23 51.2	125
6	2 50 12.39	50 10.79		15 33 27.8	33 20.0		9.30553	9.9998	3.42	4.74	125 23 52.1	126
7	2 55 3.94	55 2.51		15 56 52.6	56 45.8		9.30718	9.9855	3.43	4.76	126 23 53.0	127
8	2 59 56.59	59 55.35		16 19 53.3	19 47.5		9.30885	9.9781	3.41	4.78	127 23 53.9	128
9	3 4 50.36	4 49.30		16 42 29.6	42 24.8		9.31045	9.9702	3.42	4.80	128 23 54.8	129
10	3 9 45.22	9 44.36		17 4 40.8	4 37.0		9.31207	9.9617	3.42	4.81	129 23 55.8	130
11	3 14 41.18	14 40.52		17 26 25.7	26 22.9		9.31369	9.9586	3.42	4.82	130 23 56.8	131
12	3 19 38.25	19 37.80		17 47 43.3	47 41.5		9.31529	9.9434	3.43	4.84	131 23 57.8	132
13	3 24 36.42	24 36.18		18 8 33.0	8 32.0		9.31692	9.9338	3.43	4.85	132 23 58.8	133
14	3 29 35.72	29 35.70		18 28 54.3	28 54.0		9.31859	9.9235	3.43	4.86	133 23 59.9	134
15	3 34 36.16	34 36.35		18 48 46.6	48 47.2		9.32024	9.9126	3.42	4.86	136 0 0.9	135
16	3 39 37.73	39 38.15		19 8 9.0	8 10.6		9.32185	9.9013	3.41	4.87	136 0 2.0	136
17	3 44 40.41	44 41.06		19 27 0.6	27 3.2		9.32340	9.8894	3.42	4.88	137 0 3.1	137
18	3 49 44.18	49 45.09		19 45 21.0	45 24.3		9.32498	9.8770	3.42	4.89	138 0 4.3	138
19	3 54 49.06	54 50.23		20 3 9.7	3 13.7		9.32658	9.8641	3.41	4.90	139 0 5.5	139
20	3 59 55.04	59 56.45		20 20 26.2	20 30.9		9.32810	9.8504	3.41	4.91	140 0 6.6	140
21	4 5 2.09	5 3.76		20 37 9.6	37 14.9		9.32961	9.8358	3.40	4.92	141 0 7.8	141
22	4 10 10.20	10 12.13		20 53 19.0	53 24.8		9.33109	9.8204	3.39	4.93	142 0 9.0	142
23	4 15 19.35	15 21.54		21 8 53.7	9 0.1		9.33253	9.8042	3.39	4.94	143 0 10.2	143
24	4 20 29.52	20 32.00		21 23 53.2	24 0.2		9.33397	9.7870	3.38	4.94	144 0 11.5	144
25	4 25 40.71	25 43.46		21 38 16.9	38 24.4		9.33540	9.7680	3.36	4.94	145 0 12.7	145
26	4 30 52.90	30 55.92		21 52 4.6	52 12.5		9.33674	9.7490	3.35	4.95	146 0 14.0	146
27	4 36 6.04	36 9.35		22 5 16.1	5 24.2		9.33806	9.7300	3.33	4.96	147 0 15.2	147
28	4 41 20.11	41 23.71		22 17 50.5	17 58.8		9.33929	9.7083	3.32	4.97	148 0 16.5	148
29	4 46 35.06	46 38.96		22 29 46.8	29 55.4		9.34059	9.6849	3.30	4.97	149 0 17.8	149
30	4 51 50.88	51 55.07		22 41 4.4	41 13.2		9.34168	9.6598	3.28	4.97	150 0 19.1	150
31	4 57 7.53	57 12.04		22 51 42.9	51 51.7		9.34281	9.6334	3.23	4.97	151 0 20.5	151
June 1	5 2 24.97	2 29.78		23 1 42.4	1 50.9		9.34383	9.6051	3.21	4.99	152 0 21.8	152
2	5 7 43.14	7 48.27		23 11 2.3	11 10.7		9.34478	9.5740	3.20	4.99	153 0 23.2	153
3	5 13 1.99	13 7.44		23 19 41.9	19 50.4		9.34573	9.5401	3.16	5.00	154 0 24.6	154
4	5 18 21.51	18 27.28		23 27 40.9	27 49.3		9.34660	9.5034	3.11	5.01	155 0 26.0	155
5	5 23 41.64	23 47.74		23 34 59.0	35 7.0		9.34739	9.4692	3.06	5.01	156 0 27.4	156
6	5 29 2.32	29 8.72		23 41 35.5	41 43.0		9.34805	9.4163	3.03	5.01	157 0 28.8	157
7	5 34 23.47	34 30.19		23 47 30.2	47 37.2		9.34869	9.3654	2.96	5.01	158 0 30.1	158
8	5 39 45.06	39 52.10		23 52 43.3	52 49.7		9.34985	9.3078	2.86	5.01	159 0 31.5	159
9	5 45 7.03	45 14.39		23 57 14.6	57 20.3		9.34971	9.2399	2.76	5.01	160 0 32.9	160
10	5 50 29.31	50 36.99		24 1 3.5	1 8.5		9.35008	9.1593	2.68	5.02	161 0 34.4	161
11	5 55 51.84	55 59.86		24 4 9.8	4 13.9		9.35040	9.0578	2.53	5.01	162 0 35.8	162
12	6 1 14.58	1 22.92		24 6 33.0	6 36.1		9.35064	8.9269	2.16	5.01	163 0 37.2	163
13	6 6 37.46	6 46.12		24 8 13.5	8 15.7		9.35075	8.7415	+1.68	5.01	164 0 38.7	164
14	6 12 0.40	12 9.39		24 9 11.5	9 12.5		9.35082	+8.4063	-1.99	5.03	165 0 40.1	165
15	6 17 23.36	17 32.69		24 9 26.7	9 26.5		9.35080	-7.6478	2.46	5.02	166 0 41.6	166
16	6 22 46.28	22 55.92		24 8 58.8	8 57.3		9.35064	8.5354	2.64	5.02	167 0 43.0	167
17	6 28 9.07	28 19.03		24 7 47.8	7 44.9		9.35045	8.8092	2.72	5.02	168 0 44.5	168
18	6 33 31.67	33 41.95		24 5 53.5	5 49.2		9.35018	8.9755	2.81	5.01	169 0 45.9	169
19	6 38 54.05	39 4.64		24 3 16.2	3 10.5		9.34967	9.0933	2.89	5.01	170 0 47.3	170
20	6 44 16.17	44 27.06		23 59 56.5	59 49.0		9.34947	9.1856	3.01	5.01	171 0 48.7	171
21	6 49 37.96	49 49.15		23 55 54.4	55 45.1		9.34897	9.2684	3.06	5.01	172 0 50.1	172
22	6 54 59.33	55 10.82		23 51 9.6	50 58.6		9.34837	9.3279	3.08	5.01	173 0 51.6	173
23	7 0 20.22	0 32.00		23 45 42.1	45 29.3		9.34769	9.3846	3.11	5.00	174 0 53.0	174
24	7 5 40.60	5 52.68		23 39 32.3	39 17.5		9.34697	9.4335	3.16	5.00	175 0 54.4	175
25	7 11 0.43	11 12.81		23 32 41.0	32 24.0		9.34617	9.4768	3.21	5.01	176 0 55.8	176
26	7 16 19.66	16 32.31		23 25 8.5	24 49.4		9.34529	9.5171	3.23	5.00	177 0 57.1	177
27	7 21 38.20	21 51.13		23 16 54.4	16 33.5		9.34433	9.5532	3.26	5.00	178 0 58.5	178
28	7 26 56.01	27 9.20		23 7 59.3	7 36.3		9.34330	9.5865	3.28	5.00	179 0 59.8	179
29	7 32 13.06	32 26.50		22 58 23.4	57 58.1		9.34225	9.6173	3.31	4.98	180 1 1.1	180
30	7 37 29.33	37 43.02		22 48 7.0	47 39.4		9.34113	9.6466	3.32	4.97	181 1 2.4	181
31	7 42 44.76	42 58.72		+22 37 10.7	36 40.7		+9.33999	-9.6717	-3.36	-4.97	182 1 3.8	182

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
July	d h m s	d m s	° ' " "	° ' " "					d h m s	d
1	7 42 44.76	42 58.72	+23 37 10.7	36 40.7	+9.33990	-9.6717	-3.36	-4.97	182 1 3.8	182
2	7 47 59.33	48 13.54	22 25 35.2	25 2.8	9.33872	9.6960	-3.36	4.97	183 1 5.2	183
3	7 53 12.94	53 27.40	22 13 20.9	12 46.1	9.33735	9.7189	3.39	4.96	184 1 6.5	184
4	7 58 25.55	58 40.24	21 60 28.0	59 50.7	9.33595	9.7406	3.40	4.96	185 1 7.7	185
5	8 3 37.14	3 52.05	21 46 56.8	46 17.0	9.33451	9.7610	3.41	4.95	186 1 9.0	186
6	8 8 47.69	9 2.82	21 32 48.0	32 5.6	9.33306	9.7799	3.42	4.94	187 1 10.3	187
7	8 13 57.18	14 12.52	21 18 2.5	17 17.5	9.33151	9.7976	3.43	4.94	188 1 11.5	188
8	8 19 5.56	19 21.08	21 2 41.0	1 53.5	9.32996	9.8146	3.44	4.94	189 1 12.6	189
9	8 24 12.82	24 28.52	20 46 43.7	45 53.9	9.32836	9.8307	3.45	4.93	190 1 13.7	190
10	8 29 18.94	29 34.82	20 30 11.2	29 19.0	9.32668	9.8466	3.45	4.91	191 1 14.9	191
11	8 34 23.87	34 39.94	20 13 4.1	12 9.1	9.32501	9.8606	3.47	4.90	192 1 16.0	192
12	8 39 27.61	39 43.86	19 55 22.9	54 25.1	9.32327	9.8744	3.47	4.89	193 1 17.2	193
13	8 44 30.12	44 46.53	19 37 8.2	36 7.9	9.32146	9.8875	3.47	4.88	194 1 18.3	194
14	8 49 31.38	49 47.94	19 18 20.8	17 17.8	9.31967	9.8999	3.47	4.87	195 1 19.3	195
15	8 54 31.41	54 48.13	18 59 1.4	57 55.8	9.31796	9.9118	3.48	4.86	196 1 20.4	196
16	8 59 30.23	59 47.07	18 39 10.8	38 2.7	9.31612	9.9230	3.47	4.86	197 1 21.3	197
17	9 4 27.79	4 44.80	18 18 49.8	17 39.0	9.31431	9.9338	3.48	4.85	198 1 22.5	198
18	9 9 24.10	9 41.25	17 57 58.8	56 45.4	9.31245	9.9440	3.48	4.84	199 1 23.5	199
19	9 14 19.14	14 36.40	17 36 38.6	35 22.7	9.31056	9.9539	3.47	4.82	200 1 24.3	200
20	9 19 12.91	19 30.28	17 14 49.7	13 31.3	9.30872	9.9633	3.47	4.81	201 1 25.3	201
21	9 24 5.44	24 22.93	16 52 32.9	51 11.9	9.30689	9.9723	3.47	4.80	202 1 26.3	202
22	9 28 56.74	29 14.36	16 29 48.8	28 25.3	9.30506	9.9809	3.47	4.78	203 1 27.3	203
23	9 33 46.81	34 4.54	16 6 38.2	5 12.3	9.30320	9.9888	3.47	4.77	204 1 28.2	204
24	9 38 35.65	38 53.48	15 43 2.1	41 33.7	9.30136	9.9967	3.45	4.75	205 1 29.1	205
25	9 43 23.29	43 41.23	15 19 1.0	17 30.1	9.29950	0.0041	8.45	4.73	206 1 30.0	206
26	9 48 9.76	48 27.79	14 54 35.6	53 2.4	9.29779	0.0111	3.44	4.73	207 1 30.8	207
27	9 52 55.05	53 13.16	14 29 46.7	28 11.2	9.29603	0.0180	3.43	4.72	208 1 31.6	208
28	9 57 39.19	57 57.37	14 4 34.7	2 57.0	9.29428	0.0246	3.41	4.71	209 1 32.3	209
29	10 2 22.20	2 40.46	13 39 0.2	37 20.4	9.29250	0.0307	3.41	4.69	200 1 33.0	210
30	10 7 4.12	7 22.45	13 13 4.3	11 22.3	9.29069	0.0366	3.41	4.68	211 1 33.8	211
31	10 11 44.96	12 3.37	12 46 47.8	45 3.6	9.28894	0.0422	3.41	4.68	212 1 34.6	212
Aug. 1	10 16 24.73	16 43.21	12 20 11.3	18 25.0	9.28757	0.0476	3.38	4.67	213 1 35.3	213
2	10 21 3.44	21 21.99	11 53 15.3	51 27.0	9.28599	0.0527	3.35	4.64	214 1 36.0	214
3	10 25 41.15	25 59.75	11 26 0.6	24 10.3	9.28450	0.0575	3.35	4.61	215 1 36.6	215
4	10 30 17.92	30 36.57	10 58 28.2	56 35.9	9.28300	0.0621	3.35	4.59	216 1 37.3	216
5	10 34 53.75	35 12.47	10 30 38.7	28 44.5	9.28148	0.0664	3.34	4.57	217 1 38.0	217
6	10 39 28.64	39 47.43	10 2 32.9	0 36.9	9.28002	0.0706	3.31	4.54	218 1 38.6	218
7	10 44 2.63	44 21.47	9 34 11.5	32 13.8	9.27866	0.0744	3.30	4.53	219 1 39.2	219
8	10 48 35.75	48 54.67	9 5 35.4	3 35.9	9.27733	0.0781	3.29	4.51	210 1 39.8	220
9	10 53 8.05	53 27.01	8 36 45.1	34 44.0	9.27600	0.0815	3.26	4.49	221 1 40.4	221
10	10 57 39.54	57 58.55	8 7 41.5	5 38.7	9.27472	0.0848	3.22	4.46	222 1 41.0	222
11	11 2 10.26	2 29.34	7 38 25.2	36 20.8	9.27358	0.0878	3.22	4.44	223 1 41.6	223
12	11 6 40.27	6 59.40	7 8 57.0	6 51.2	9.27244	0.0906	3.22	4.39	224 1 42.1	224
13	11 11 9.57	11 28.75	6 39 17.6	37 10.4	9.27129	0.0933	3.18	4.36	225 1 42.7	225
14	11 15 38.17	15 57.41	6 9 27.7	7 19.1	9.27023	0.0957	3.16	4.35	226 1 43.2	226
15	11 20 6.15	20 25.43	5 39 28.1	37 18.1	9.26921	0.0980	3.08	4.31	227 1 43.7	227
16	11 24 33.53	24 52.88	5 9 19.3	7 7.9	9.26833	0.1002	3.06	4.26	228 1 44.3	228
17	11 29 0.40	29 19.80	4 39 2.0	36 49.4	9.26753	0.1021	3.06	4.21	229 1 44.8	229
18	11 33 26.78	33 46.24	4 8 37.0	6 23.2	9.26672	0.1038	3.01	4.17	230 1 45.3	230
19	11 37 52.68	38 12.20	3 38 5.1	35 50.2	9.26597	0.1064	2.96	4.11	231 1 45.8	231
20	11 42 18.15	42 37.73	3 7 26.9	5 11.0	9.26531	0.1067	2.91	4.08	232 1 46.3	232
21	11 46 43.24	47 2.89	2 36 43.2	34 26.2	9.26471	0.1081	2.86	3.99	233 1 46.8	233
22	11 51 7.98	51 27.69	2 5 54.5	3 36.6	9.26415	0.1091	2.76	3.90	234 1 47.3	234
23	11 55 32.41	55 52.18	1 35 1.7	32 43.0	9.26370	0.1100	2.68	3.80	235 1 47.7	235
24	11 59 56.50	60 16.41	1 4 5.4	1 46.0	9.26333	0.1107	2.50	3.71	236 1 48.1	236
25	12 4 20.56	4 40.46	0 33 6.3	30 46.2	9.26300	0.1113	2.38	3.59	237 1 48.6	237
26	12 8 44.36	9 4.34	0 2 4.9	0 16.0	9.26278	0.1119	2.16	-3.16	238 1 49.1	238
27	12 13 8.05	13 28.10	0 28 58.1	31 19.8	9.26267	0.1120	-2.16		239 1 49.5	239
28	12 17 31.67	17 51.80	1 0 1.8	2 24.2	9.26252	0.1121	+1.38	+3.16	240 1 50.0	240
29	12 21 55.23	22 15.44	1 31 5.5	33 28.4	9.26252	0.1120	1.68	3.37	241 1 50.4	241
30	12 26 18.89	26 39.08	2 2 8.5	4 31.9	9.26250	0.1118	2.38	3.62	242 1 50.8	242
31	12 30 42.40	31 2.78	2 33 10.5	35 34.3	+9.26252	-0.1115	+2.59	+3.82	243 1 51.3	243

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side-real Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
	d h m s	m s		° ' "	' "						d h m s	d
Sept. 1	12 35 6.10	35 26.58	-	3 4 10.7	6 34.9	+9.26290	-0.1109	+2.59	+3.94	244 1 51.8	244	
2	12 39 29.97	39 50.55		3 35 8.0	37 32.7	9.26313	0.1101	2.68	3.99	245 1 52.3	245	
3	12 43 54.00	44 14.69		4 6 1.6	8 26.8	9.26339	0.1093	2.81	4.04	246 1 52.8	246	
4	12 48 18.22	48 39.01		4 36 51.2	39 16.5	9.26377	0.1083	2.81	4.13	247 1 53.2	247	
5	12 52 42.70	53 3.57		5 7 36.1	10 1.4	9.26421	0.1071	2.89	4.19	248 1 53.6	248	
6	12 57 7.45	57 28.44		5 38 15.4	40 40.8	9.26473	0.1056	2.96	4.22	249 1 54.1	249	
7	13 1 32.53	1 53.64		6 8 48.2	11 13.8	9.26534	0.1040	2.96	4.26	250 1 54.6	250	
8	13 5 58.00	6 19.23		6 39 14.0	41 39.7	9.26595	0.1023	3.01	4.31	251 1 55.1	251	
9	13 10 23.86	10 45.22		7 9 32.1	11 57.7	9.26662	0.1003	3.04	4.35	252 1 55.6	252	
10	13 14 50.15	15 11.62		7 39 41.7	42 7.1	9.26736	0.0981	3.10	4.36	253 1 56.0	253	
11	13 19 16.91	19 38.51		8 9 42.0	12 7.3	9.26818	0.0959	3.10	4.41	254 1 56.5	254	
12	13 23 44.19	24 5.93		8 39 32.6	41 57.7	9.26904	0.0934	3.14	4.45	255 1 57.0	255	
13	13 28 12.00	28 33.88		9 9 12.6	11 37.4	9.26994	0.0908	3.16	4.47	256 1 57.5	256	
14	13 32 40.40	33 2.42		9 38 41.3	41 5.8	9.27089	0.0879	3.19	4.50	257 1 58.0	257	
15	13 37 9.41	37 31.59		10 7 57.8	10 22.0	9.27189	0.0848	3.21	4.53	258 1 58.6	258	
16	13 41 39.06	42 1.41		10 37 1.5	39 25.3	9.27299	0.0815	3.23	4.53	259 1 59.2	259	
17	13 46 9.40	46 31.93		11 5 51.6	8 15.0	9.27414	0.0780	3.23	4.56	260 1 59.8	260	
18	13 50 40.47	51 3.16		11 34 27.5	36 50.3	9.27529	0.0743	3.28	4.57	261 2 0.4	261	
19	13 55 12.27	55 35.14		12 2 48.4	5 10.5	9.27650	0.0704	3.29	4.59	262 2 0.9	262	
20	13 59 44.86	60 7.90		12 30 53.5	33 14.9	9.27778	0.0662	3.29	4.61	263 2 1.5	263	
21	14 4 18.27	4 41.49		12 58 42.1	1 2.8	9.27907	0.0619	3.33	4.62	264 2 2.1	264	
22	14 8 52.51	9 15.93		13 26 13.7	28 33.6	9.28044	0.0573	3.35	4.65	265 2 2.7	265	
23	14 13 27.63	13 51.23		13 53 27.4	55 46.4	9.28187	0.0524	3.36	4.66	266 2 3.3	266	
24	14 18 3.67	18 27.46		14 20 22.5	22 40.7	9.28335	0.0474	3.36	4.68	267 2 4.0	267	
25	14 22 40.65	23 4.67		14 46 58.4	49 15.7	9.28481	0.0420	3.37	4.69	268 2 4.7	268	
26	14 27 18.58	27 42.83		15 13 14.3	15 30.6	9.28632	0.0364	3.38	4.71	269 2 5.4	269	
27	14 31 57.49	32 21.96		15 39 9.5	41 24.7	9.28787	0.0305	3.41	4.73	270 2 6.1	270	
28	14 36 37.41	37 2.11		16 4 43.1	6 57.1	9.28948	0.0243	3.41	4.74	271 2 6.8	271	
29	14 41 18.37	41 43.29		16 29 54.4	32 7.1	9.29109	0.0178	3.41	4.75	272 2 7.5	272	
30	14 46 0.37	46 25.55		16 54 42.8	56 54.2	9.29269	0.0111	3.41	4.78	273 2 8.4	273	
Oct. 1	14 50 43.42	51 8.86		17 19 7.5	21 17.5	9.29433	0.0037	3.41	4.78	274 2 9.2	274	
2	14 55 27.55	55 53.25		17 43 7.4	45 16.1	9.29600	0.9962	3.41	4.79	275 2 10.0	275	
3	15 0 12.76	0 38.71		18 6 41.9	8 49.2	9.29760	0.9884	3.41	4.81	276 2 10.8	276	
4	15 4 59.03	5 25.24		18 29 50.6	31 56.2	9.29924	0.9802	3.43	4.82	277 2 11.6	277	
5	15 9 46.39	10 12.87		18 52 32.5	54 36.4	9.30093	0.9714	3.42	4.83	278 2 12.4	278	
6	15 14 34.87	15 1.63		19 14 46.7	16 48.8	9.30261	0.9623	3.41	4.84	279 2 13.3	279	
7	15 19 24.45	19 51.49		19 36 32.6	38 32.7	9.30422	0.9529	3.41	4.85	280 2 14.2	280	
8	15 24 15.10	24 42.42		19 57 49.8	59 47.9	9.30582	0.9430	3.41	4.86	281 2 15.1	281	
9	15 29 6.82	29 34.43		20 18 37.4	20 33.7	9.30745	0.9325	3.40	4.87	282 2 16.0	282	
10	15 33 59.63	34 27.52		20 38 54.5	40 48.8	9.30901	0.9214	3.40	4.88	283 2 16.9	283	
11	15 38 53.48	39 21.67		20 58 40.3	60 32.4	9.31053	0.9099	3.40	4.90	284 2 17.9	284	
12	15 43 48.36	44 16.85		21 17 54.4	19 44.1	9.31205	0.8978	3.38	4.90	285 2 18.9	285	
13	15 48 44.26	49 13.06		21 36 36.0	38 23.2	9.31355	0.8852	3.38	4.91	286 2 19.9	286	
14	15 53 41.17	54 10.27		21 54 44.7	56 29.4	9.31504	0.8719	3.36	4.91	287 2 20.9	287	
15	15 58 39.08	59 8.49		22 12 19.7	14 1.8	9.31644	0.8579	3.35	4.93	288 2 21.9	288	
16	16 3 37.94	4 7.66		22 29 20.4	30 59.8	9.31778	0.8431	3.36	4.94	289 2 23.0	289	
17	16 8 37.72	9 7.77		22 45 46.0	47 22.7	9.31917	0.8276	3.33	4.94	290 2 24.1	290	
18	16 13 38.44	14 8.79		23 1 36.0	3 9.7	9.32047	0.8112	3.29	4.95	291 2 25.1	291	
19	16 18 40.04	19 10.68		23 16 49.8	18 20.4	9.32167	0.7937	3.26	4.95	292 2 26.1	292	
20	16 23 42.45	24 13.39		23 31 26.6	32 54.2	9.32280	0.7753	3.29	4.96	293 2 27.2	293	
21	16 28 45.64	29 16.89		23 45 26.1	46 50.4	9.32393	0.7558	3.28	4.96	294 2 28.3	294	
22	16 33 49.60	34 21.18		23 58 47.8	60 8.8	9.32510	0.7355	3.22	4.97	295 2 29.4	295	
23	16 38 54.34	39 25.23		24 11 31.5	12 49.1	9.32615	0.7136	3.18	4.98	296 2 30.5	296	
24	16 43 59.80	44 32.00		24 23 36.4	24 50.4	9.32706	0.6900	3.14	4.98	297 2 31.6	297	
25	16 49 5.90	49 38.41		24 35 1.7	36 12.2	9.32790	0.6647	3.13	4.99	298 2 32.8	298	
26	16 54 12.56	54 45.39		24 45 47.1	46 53.9	9.32874	0.6379	3.08	4.99	299 2 34.0	299	
27	16 59 19.78	59 52.92		24 55 52.5	56 55.4	9.32950	0.6090	3.01	4.99	300 2 35.2	300	
28	17 4 27.50	5 0.95		25 5 17.5	6 16.5	9.33015	0.5780	2.93	5.00	301 2 36.4	301	
29	17 9 35.65	10 9.40		25 14 1.8	14 56.7	9.33073	0.5439	2.83	5.01	302 2 37.6	302	
30	17 14 44.17	15 18.21		25 22 4.7	22 55.4	9.33119	0.5063	2.68	5.01	303 2 38.8	303	
31	17 19 52.98	20 27.31		25 29 25.8	30 12.3	9.33151	0.4659	2.59	5.01	304 2 40.0	304	
32	17 25 2.00	25 36.61		25 36 5.0	36 47.0	+9.33177	-0.4193	+2.46	+5.01	305 2 41.2	305	

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.			Apparent Declination.			Log Factor 1.		Log Factor 2.		Mean Solar Time of Meridian Transit.	Side- real Date of Transit.
	At Mean Noon.	At Transit.		At Mean Noon.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
Nov. 1	17 25 2.00	25 36.61	25° 36' 5.0	36 47.0	+9.33177	-9.4193	+2.46	+5.01	305	2 41.2	305	
2	17 30 11.18	30 46.06	25 42 2.0	42 39.6	9.33199	9.3679	+2.16	5.01	306	2 42.4	306	
3	17 35 20.49	35 55.64	25 47 16.8	47 49.9	9.33213	9.3098	-2.16	5.01	307	2 43.6	307	
4	17 40 29.87	41 5.27	25 51 49.4	52 17.8	9.33215	9.2422	2.53	5.02	308	2 44.8	308	
5	17 45 39.19	46 14.85	25 55 39.4	56 3.0	9.33201	9.1605	2.76	5.02	309	2 46.0	309	
6	17 50 48.36	51 24.25	25 58 46.3	59 5.2	9.33170	9.0599	2.86	5.02	310	2 47.2	310	
7	17 55 57.28	56 33.39	26 1 10.2	1 24.3	9.33130	8.9291	2.93	5.01	311	2 48.4	311	
8	18 1 5.89	1 42.22	26 2 51.3	3 0.4	9.33083	8.7442	3.04	5.02	312	2 49.6	312	
9	18 6 14.13	6 50.68	26 3 49.9	3 58.9	9.33026	-8.4122	3.11	5.02	313	2 50.9	313	
10	18 11 21.91	11 58.67	26 4 5.8	4 4.8	9.32956	+7.5898	3.18	5.01	314	2 52.1	314	
11	18 16 29.14	17 6.08	26 3 39.1	3 33.1	9.32874	8.5183	3.23	5.02	315	2 53.2	315	
12	18 21 35.75	22 12.85	26 2 30.2	2 19.0	9.32776	8.7969	3.28	5.02	316	2 54.4	316	
13	18 26 41.64	27 18.89	26 0 38.7	0 22.2	9.32669	8.9661	3.32	5.01	317	2 55.5	317	
14	18 31 46.74	32 24.13	25 58 4.5	57 42.8	9.32554	9.0859	3.36	5.00	318	2 56.7	318	
15	18 36 50.98	37 28.49	25 54 48.2	54 21.2	9.32423	9.1785	3.41	5.00	319	2 57.8	319	
16	18 41 54.25	42 31.86	25 50 50.3	50 17.9	9.32274	9.2544	3.42	5.00	320	2 58.9	320	
17	18 46 56.46	47 34.15	25 46 10.9	45 33.1	9.32117	9.3191	3.43	5.00	321	3 0.0	321	
18	18 51 57.57	52 35.36	25 40 50.1	40 6.8	9.31958	9.3754	3.47	5.00	322	3 1.1	322	
19	18 56 57.55	57 35.43	25 34 48.2	33 59.5	9.31790	9.4244	3.50	4.99	323	3 2.2	323	
20	19 1 56.32	2 34.25	25 28 5.9	27 11.9	9.31610	9.4669	3.54	4.98	324	3 3.2	324	
21	19 6 53.79	7 31.74	25 20 43.7	19 44.3	9.31412	9.5063	3.56	4.98	325	3 4.2	325	
22	19 11 49.84	12 27.81	25 12 42.0	11 37.2	9.31195	9.5422	3.58	4.96	326	3 5.2	326	
23	19 16 44.39	17 22.37	25 4 0.9	2 50.7	9.30967	9.5747	3.57	4.96	327	3 6.2	327	
24	19 21 37.39	22 15.36	24 54 41.1	53 25.5	9.30739	9.6045	3.58	4.95	328	3 7.2	328	
25	19 26 28.82	27 6.77	24 44 42.9	43 21.9	9.30504	9.6323	3.59	4.95	329	3 8.1	329	
26	19 31 18.64	31 56.56	24 34 6.7	32 40.4	9.30255	9.6582	3.60	4.94	330	3 9.0	330	
27	19 36 6.76	36 44.62	24 22 53.1	21 21.6	9.29992	9.6819	3.65	4.94	331	3 9.9	331	
28	19 40 53.09	41 30.87	24 11 3.1	9 26.4	9.29711	9.7034	3.65	4.93	332	3 10.7	332	
29	19 45 37.56	46 15.25	23 58 37.4	56 55.6	9.29428	9.7245	3.67	4.93	333	3 11.5	333	
30	19 50 20.15	50 57.70	23 45 36.6	43 49.8	9.29135	9.7439	3.68	4.91	334	3 12.1	334	
Dec. 1	19 55 0.79	55 38.19	23 32 1.1	30 9.3	9.28825	9.7622	3.69	4.90	335	3 12.8	335	
2	19 59 39.40	60 16.64	23 17 51.6	15 54.8	9.28504	9.7795	3.71	4.89	336	3 13.5	336	
3	20 4 15.92	4 53.01	23 3 8.7	1 7.1	9.28171	9.7957	3.72	4.87	337	3 14.2	337	
4	20 8 50.30	9 27.27	22 47 53.4	45 47.1	9.27830	9.8108	3.73	4.87	338	3 14.9	338	
5	20 13 22.49	13 59.31	22 32 6.6	29 55.6	9.27477	9.8251	3.75	4.86	339	3 15.5	339	
6	20 17 52.43	18 29.04	22 15 48.9	13 33.4	9.27107	9.8386	3.76	4.85	340	3 16.0	340	
7	20 22 20.03	22 56.39	21 59 1.2	56 41.3	9.26724	9.8514	3.76	4.84	341	3 16.5	341	
8	20 26 45.26	27 21.36	21 41 44.3	39 20.2	9.26331	9.8634	3.76	4.82	342	3 17.0	342	
9	20 31 8.07	31 43.91	21 23 59.3	21 31.1	9.25927	9.8747	3.76	4.81	343	3 17.5	343	
10	20 35 28.41	36 3.98	21 5 46.9	3 14.6	9.25506	9.8855	3.78	4.80	344	3 17.8	344	
11	20 39 46.20	40 21.49	20 47 7.6	44 31.4	9.25077	9.8959	3.79	4.78	345	3 18.2	345	
12	20 44 1.42	44 36.39	20 28 2.2	25 22.4	9.24635	9.9055	3.81	4.75	346	3 18.5	346	
13	20 48 14.01	48 48.66	20 8 31.9	5 48.5	9.24178	9.9145	3.82	4.73	347	3 18.8	347	
14	20 52 23.92	52 58.25	19 48 37.9	45 50.9	9.23709	9.9229	3.82	4.72	348	3 19.1	348	
15	20 56 31.10	57 5.08	19 28 21.1	25 30.6	9.23224	9.9310	3.83	4.71	349	3 19.2	349	
16	21 0 35.50	1 9.10	19 7 42.0	4 48.5	9.22727	9.9387	3.83	4.69	350	3 19.3	350	
17	21 4 37.08	5 10.29	18 46 41.4	43 45.1	9.22218	9.9459	3.84	4.68	351	3 19.3	351	
18	21 8 35.81	9 8.63	18 25 20.4	22 21.3	9.21693	9.9527	3.85	4.64	352	3 19.4	352	
19	21 12 31.64	13 4.06	18 3 39.9	0 38.2	9.21156	9.9590	3.86	4.62	353	3 19.4	353	
20	21 16 24.54	16 56.54	17 41 40.9	38 36.8	9.20604	9.9649	3.86	4.60	354	3 19.3	354	
21	21 20 14.45	20 46.00	17 19 24.3	16 18.0	9.20036	9.9705	3.87	4.59	355	3 19.1	355	
22	21 24 1.33	24 32.44	16 56 50.9	53 42.6	9.19454	9.9758	3.88	4.56	356	3 19.0	356	
23	21 27 45.14	28 15.80	16 34 1.6	30 51.3	9.18852	9.9807	3.89	4.52	357	3 18.8	357	
24	21 31 25.82	31 56.01	16 10 57.5	7 45.4	9.18230	9.9851	3.89	4.48	358	3 18.5	358	
25	21 35 3.31	35 33.00	15 47 39.7	44 26.2	9.17585	9.9892	3.89	4.46	359	3 18.1	359	
26	21 38 37.56	39 6.73	15 24 9.3	20 54.5	9.16925	9.9930	3.90	4.41	360	3 17.7	360	
27	21 42 8.55	42 37.20	14 60 27.2	57 11.2	9.16239	9.9963	3.91	4.37	361	3 17.3	361	
28	21 45 36.25	46 04.33	14 36 34.4	33 17.4	9.15539	9.9995	3.92	4.33	362	3 16.9	362	
29	21 49 0.48	49 28.06	14 12 31.7	9 13.9	9.14813	0.0024	3.93	4.26	363	3 16.4	363	
30	21 52 21.24	52 48.29	13 48 20.0	45 1.7	9.14057	0.0049	3.94	4.21	364	3 15.8	364	
31	21 55 38.46	56 4.92	-13 24 0.6	20 41.8	+9.13279	+0.0070	-3.95	+4.15	365	3 15.1	365	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.															
Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of <i>t</i> in Sidereal Minutes.		Log. Coefficient of <i>t</i> ² .					
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.				
Jan.	d	h m	d	h m s	m s	° ′	° ′	+9.01175	+9.8619	-2.90					
	1	5 7.1	1	23 50 46.42	53 13.70	-1 23 5.6	5 41.5								
	2	5 5.6	2	23 53 14.39	55 42.01	1 5 38.0	48 12.3	9.01194	9.8619	2.23					
	3	5 4.1	3	23 55 42.44	58 10.39	0 48 10.2	30 43.1	9.01216	9.8619	2.24					
			4	23 58 10.56		0 30 42.4		9.01235	9.8619	2.26					
	4	5 2.7	5	0 0 38.75	0 38.82	-0 13 14.8	13 14.0	9.01254	9.8618	2.28					
	5	5 1.2	6	0 3 7.00	3 7.31	+0 4 12.5	4 14.8	9.01273	9.8616	2.30	-3.08				
	6	4 59.7	7	0 5 35.32	5 35.89	0 21 39.3	21 43.5	9.01295	9.8614	2.32	3.20				
	7	4 58.3	8	0 8 3.72	8 4.55	0 39 5.4	39 11.4	9.01320	9.8610	2.34	3.28				
	8	4 56.8	9	0 10 32.21	10 33.30	0 56 30.6	56 38.4	9.01348	9.8606	2.36	3.35				
	9	4 55.4	10	0 13 0.80	13 2.14	1 13 54.9	14 4.4	9.01376	9.8602	2.37	3.42				
	10	4 53.9	11	0 15 29.48	15 31.08	1 31 18.1	31 29.3	9.01405	9.8597	2.38	3.49				
	11	4 52.5	12	0 17 58.26	18 0.12	1 48 40.0	48 53.0	9.01434	9.8591	2.39	3.55				
	12	4 51.0	13	0 20 27.15	20 29.26	2 6 0.4	6 15.3	9.01464	9.8586	2.40	3.58				
	13	4 49.6	14	0 22 56.13	22 58.51	2 23 19.3	23 35.9	9.01493	9.8578	2.41	3.61				
	14	4 48.1	15	0 25 25.22	25 27.86	2 40 36.5	40 54.8	9.01525	9.8571	2.42	3.64				
	15	4 46.7	16	0 27 54.42	27 57.32	2 57 51.8	58 11.9	9.01557	9.8563	2.42	3.66				
	16	4 45.2	17	0 30 23.73	30 26.90	3 15 5.2	15 27.0	9.01590	9.8555	2.42	3.68				
	17	4 43.8	18	0 32 53.16	32 56.59	3 32 16.6	32 40.1	9.01624	9.8546	2.42	3.73				
	18	4 42.3	19	0 35 22.70	35 26.39	3 49 25.7	49 50.9	9.01656	9.8536	2.42	3.76				
	19	4 40.9	20	0 37 52.25	37 56.30	4 6 32.4	6 59.4	9.01687	9.8526	2.43	3.78				
	20	4 39.4	21	0 40 22.11	40 26.33	4 23 36.7	24 5.4	9.01719	9.8515	2.44	3.80				
	21	4 38.0	22	0 42 51.98	42 56.46	4 40 38.4	41 8.8	9.01753	9.8504	2.45	3.82				
	22	4 36.6	23	0 45 21.97	45 26.70	4 57 37.3	58 9.4	9.01785	9.8492	2.46	3.83				
	23	4 35.1	24	0 47 52.06	47 57.06	5 14 33.3	15 7.2	9.01816	9.8479	2.47	3.85				
	24	4 33.7	25	0 50 22.27	50 27.55	5 31 26.4	32 1.9	9.01851	9.8466	2.48	3.87				
	25	4 32.3	26	0 52 52.60	52 58.16	5 48 16.3	48 53.5	9.01887	9.8452	2.49	3.88				
	26	4 30.9	27	0 55 23.06	55 28.88	6 5 3.0	5 41.8	9.01926	9.8438	2.51	3.90				
	27	4 29.4	28	0 57 53.66	57 59.73	6 21 46.3	22 26.7	9.01966	9.8423	2.53	3.92				
	28	4 28.0	29	1 0 24.40	0 30.74	6 38 26.1	39 8.1	9.02008	9.8408	2.55	3.93				
	29	4 26.6	30	1 2 55.29	3 1.90	6 55 2.3	55 45.9	9.02054	9.8392	2.57	3.95				
	30	4 25.2	31	1 5 26.35	5 33.23	7 11 34.8	12 20.0	9.02101	9.8375	2.58	3.97				
	31	4 23.8	32	1 7 57.57	8 4.72	7 28 3.4	28 50.2	9.02149	9.8358	2.60	3.98				
Feb.	1	4 22.3	33	1 10 28.96	10 36.38	7 44 28.0	45 16.4	9.02199	9.8340	2.61	3.99				
	2	4 20.9	34	1 13 0.53	13 8.22	8 0 48.6	1 38.4	9.02251	9.8322	2.63	4.00				
	3	4 19.5	35	1 15 32.28	15 40.24	8 17 5.0	17 56.2	9.02302	9.8303	2.64	4.01				
	4	4 18.1	36	1 18 4.21	18 12.45	8 33 17.0	34 9.7	9.02355	9.8283	2.65	4.02				
	5	4 16.7	37	1 20 36.33	20 44.85	8 49 24.6	50 18.8	9.02410	9.8263	2.66	4.03				
	6	4 15.3	38	1 23 8.64	23 17.45	9 5 27.7	6 23.3	9.02465	9.8243	2.67	4.05				
	7	4 13.9	39	1 25 41.15	25 50.24	9 21 26.1	22 23.2	9.02523	9.8221	2.68	4.06				
	8	4 12.5	40	1 28 13.87	28 23.24	9 37 19.7	38 18.3	9.02582	9.8199	2.69	4.07				
	9	4 11.1	41	1 30 46.79	30 56.45	9 53 8.5	54 8.4	9.02640	9.8177	2.70	4.08				
	10	4 9.8	42	1 33 19.92	33 29.87	10 8 52.3	9 53.5	9.02700	9.8153	2.71	4.09				
	11	4 8.4	43	1 35 53.26	36 3.49	10 24 30.9	25 33.4	9.02760	9.8129	2.72	4.10				
	12	4 7.0	44	1 38 26.82	38 37.34	10 40 4.3	41 8.1	9.02821	9.8104	2.73	4.11				
	13	4 5.7	45	1 41 0.59	41 11.40	10 55 32.3	56 37.4	9.02882	9.8079	2.74	4.12				
	14	4 4.3	46	1 43 34.58	43 45.68	11 10 54.8	12 1.2	9.02944	9.8053	2.74	4.13				
	15	4 2.9	47	1 46 8.80	46 20.19	11 26 11.8	27 19.3	9.03006	9.8026	2.74	4.14				
	16	4 1.6	48	1 48 43.25	48 54.93	11 41 23.0	42 31.7	9.03069	9.7998	2.74	4.15				
	17	4 0.2	49	1 51 17.92	51 29.89	11 56 28.3	57 38.2	9.03133	9.7970	2.74	4.16				
	18	3 58.9	50	1 53 52.81	54 5.07	12 11 27.6	12 38.7	9.03197	9.7941	2.74	4.17				
	19	3 57.5	51	1 56 27.92	56 40.48	12 26 20.8	27 33.1	9.03259	9.7910	2.75	4.18				
	20	3 56.2	52	1 59 3.25	59 16.11	12 41 7.7	42 21.1	9.03319	9.7879	2.75	4.19				
	21	3 54.8	53	2 1 38.79	1 51.95	12 55 48.2	57 2.6	9.03379	9.7848	2.75	4.19				
	22	3 53.5	54	2 4 14.55	4 28.01	13 10 22.2	11 37.5	9.03440	9.7815	2.75	4.20				
	23	3 52.1	55	2 6 50.53	7 4.29	13 24 49.6	26 5.9	9.03503	9.7782	2.75	4.21				
	24	3 50.8	56	2 9 26.74	9 40.81	13 39 10.3	40 27.6	9.03568	9.7748	2.76	4.21				
	25	3 49.5	57	2 12 3.19	12 17.57	13 53 24.2	54 42.5	9.03636	9.7713	2.76	4.22				
	26	3 48.2	58	2 14 39.89	14 54.58	14 7 31.3	8 50.5	9.03704	9.7677	2.77	4.23				
	27	3 46.9	59	2 17 16.83	17 31.83	14 21 31.3	22 51.4	9.03772	9.7641	2.78	4.24				
	28	3 45.6	60	2 19 54.02	20 9.33	14 35 24.2	36 45.2	9.03841	9.7604	2.79	4.24				
	29	3 44.2	61	2 22 31.46	22 47.08	14 49 10.0	50 31.7	9.03911	9.7566	2.80	4.25				
	30	3 42.9	62	2 25 9.16	25 25.09	+15 2 48.4	4 10.9	+9.03981	+9.7526	-2.80	-4.25				

ERRATUM. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 3 44.2	61	2 22 31.46	22 37.08	+14 49 10.0	50 31.7	+9.03911	+9.75566	-2.80	-4.26
2 3 42.9	62	2 25 9.16	25 25.09	15 2 48.4	4 10.9	9.03961	9.7526	2.80	4.25
3 3 41.6	63	2 27 47.11	28 3.36	15 16 19.4	17 42.7	9.04061	9.7486	2.80	4.26
4 3 40.3	64	2 30 25.32	30 41.89	15 29 43.0	31 7.0	9.04122	9.7446	2.80	4.26
5 3 39.0	65	2 33 3.79	33 20.69	15 42 59.0	44 23.6	9.04194	9.7404	2.80	4.27
6 3 37.8	66	2 35 42.52	35 59.73	15 56 7.3	57 32.5	9.04267	9.7362	2.81	4.27
7 3 36.5	67	2 38 21.52	38 39.06	16 9 7.8	10 33.6	9.04342	9.7318	2.82	4.28
8 3 35.2	68	2 41 0.80	41 18.66	16 22 0.4	23 26.7	9.04417	9.7273	2.83	4.28
9 3 33.9	69	2 43 40.35	43 58.54	16 34 45.0	36 11.8	9.04492	9.7228	2.83	4.29
10 3 32.6	70	2 46 20.18	46 38.69	16 47 21.5	48 48.8	9.04568	9.7181	2.83	4.29
11 3 31.4	71	2 49 0.20	49 19.12	16 59 49.7	1 17.5	9.04642	9.7132	2.82	4.30
12 3 30.1	72	2 51 40.67	51 59.82	17 12 9.6	13 37.8	9.04714	9.7083	2.81	4.30
13 3 28.8	73	2 54 21.31	54 40.79	17 24 21.1	25 49.6	9.04786	9.7033	2.80	4.31
14 3 27.6	74	2 57 2.22	57 22.03	17 36 24.1	37 52.9	9.04857	9.6982	2.80	4.32
15 3 26.4	75	2 59 43.39	0 3.54	17 48 18.5	49 47.5	9.04927	9.6929	2.80	4.32
16 3 25.1	76	3 2 24.82	2 45.31	18 0 4.1	1 33.3	9.04997	9.6874	2.80	4.33
17 3 23.9	77	3 5 6.51	5 27.34	18 11 40.8	13 10.2	9.05067	9.6819	2.80	4.33
18 3 22.6	78	3 7 48.46	8 9.63	18 23 8.5	24 38.1	9.05137	9.6762	2.80	4.33
19 3 21.4	79	3 10 30.67	10 52.18	18 34 27.2	35 56.8	9.05205	9.6704	2.79	4.34
20 3 20.2	80	3 13 13.13	13 34.08	18 45 36.7	47 6.4	9.05273	9.6644	2.78	4.35
21 3 19.0	81	3 15 55.85	16 18.04	18 56 37.0	58 6.7	9.05340	9.6583	2.76	4.35
22 3 17.8	82	3 18 38.81	19 1.34	19 7 28.0	8 57.6	9.05404	9.6521	2.76	4.35
23 3 16.5	83	3 21 22.01	21 44.89	19 18 9.6	19 39.1	9.05469	9.6456	2.76	4.36
24 3 15.3	84	3 24 5.46	24 28.68	19 28 41.7	30 11.1	9.05534	9.6391	2.76	4.36
25 3 14.1	85	3 26 49.15	27 12.71	19 39 4.2	40 33.5	9.05598	9.6324	2.76	4.36
26 3 12.9	86	3 29 33.08	29 56.99	19 49 17.1	50 46.1	9.05661	9.6255	2.76	4.37
27 3 11.7	87	3 32 17.25	32 41.51	19 59 20.3	0 48.9	9.05725	9.6185	2.76	4.37
28 3 10.5	88	3 35 1.66	35 26.27	20 9 13.6	10 41.9	9.05790	9.6113	2.76	4.38
29 3 9.3	89	3 37 46.32	38 11.28	20 18 57.0	20 24.9	9.05853	9.6038	2.76	4.38
30 3 8.2	90	3 40 31.21	40 56.52	20 28 30.4	29 57.9	9.05916	9.5963	2.76	4.38
31 3 7.0	91	3 43 16.35	43 42.01	20 37 53.8	39 20.9	9.05978	9.5886	2.75	4.38
Apr. 1 3 5.8	92	3 46 1.72	46 27.73	20 47 7.2	48 33.8	9.06041	9.5807	2.75	4.39
2 3 4.6	93	3 48 47.33	49 13.69	20 56 10.4	57 36.4	9.06102	9.5725	2.74	4.39
3 3 3.5	94	3 51 33.17	51 59.89	21 5 3.4	6 28.7	9.06163	9.5641	2.74	4.40
4 3 2.3	95	3 54 19.24	54 46.32	21 13 46.0	15 10.7	9.06223	9.5555	2.74	4.40
5 3 1.1	96	3 57 5.54	57 32.08	21 22 18.3	23 42.1	9.06283	9.5466	2.74	4.40
6 3 0.0	97	3 59 52.07	0 19.87	21 30 40.0	32 3.1	9.06343	9.5375	2.74	4.40
7 2 58.8	98	4 2 38.83	3 6.90	21 38 51.2	40 13.5	9.06402	9.5282	2.72	4.41
8 2 57.7	99	4 5 25.81	5 54.33	21 46 51.8	48 13.3	9.06466	9.5186	2.70	4.41
9 2 56.5	100	4 8 12.99	8 41.88	21 54 41.8	56 2.3	9.06510	9.5087	2.70	4.41
10 2 55.4	101	4 11 0.38	11 29.63	22 2 21.0	3 40.5	9.06563	9.4984	2.68	4.42
11 2 54.2	102	4 13 47.97	14 17.58	22 9 49.3	11 7.9	9.06614	9.4879	2.65	4.42
12 2 53.1	103	4 16 35.76	17 5.73	22 17 6.8	18 24.3	9.06664	9.4771	2.63	4.42
13 2 52.0	104	4 19 23.73	19 54.06	22 24 13.4	25 29.7	9.06710	9.4660	2.61	4.42
14 2 50.8	105	4 22 11.88	22 42.57	22 31 9.0	32 24.1	9.06755	9.4545	2.59	4.42
15 2 49.7	106	4 25 0.20	25 31.25	22 37 53.6	39 7.4	9.06799	9.4426	2.57	4.42
16 2 48.6	107	4 27 48.69	28 20.09	22 44 27.0	45 39.5	9.06842	9.4303	2.55	4.43
17 2 47.4	108	4 30 37.34	31 9.09	22 50 49.3	52 0.4	9.06880	9.4176	2.54	4.43
18 2 46.3	109	4 33 26.13	33 58.24	22 57 0.3	58 10.0	9.06918	9.4044	2.52	4.43
19 2 45.2	110	4 36 15.07	36 47.54	23 3 0.1	4 8.4	9.06954	9.3908	2.51	4.43
20 2 44.1	111	4 39 4.14	39 36.98	23 8 48.6	9 55.4	9.06987	9.3767	2.49	4.43
21 2 43.0	112	4 41 53.34	42 26.54	23 14 25.8	15 31.1	9.07020	9.3622	2.48	4.44
22 2 41.9	113	4 44 42.67	45 16.23	23 19 51.7	20 55.4	9.07063	9.3471	2.47	4.44
23 2 40.8	114	4 47 32.12	48 6.03	23 25 6.2	26 8.3	9.07101	9.3313	2.46	4.44
24 2 39.7	115	4 50 21.67	50 55.93	23 30 9.3	31 9.7	9.071106	9.3149	2.44	4.44
25 2 38.6	116	4 53 11.32	53 45.94	23 35 0.9	35 59.5	9.07133	9.2978	2.41	4.44
26 2 37.5	117	4 56 1.08	56 36.05	23 39 41.0	40 37.8	9.07159	9.2799	2.39	4.44
27 2 36.4	118	4 58 50.93	58 26.26	23 44 9.6	45 4.5	9.07182	9.2613	2.36	4.44
28 2 35.3	119	5 1 40.87	2 16.56	23 48 26.6	49 19.6	9.07205	9.2417	2.33	4.44
29 2 34.2	120	5 4 30.90	5 6.94	23 52 32.0	53 23.0	9.07227	9.2210	2.28	4.45
30 2 33.1	121	5 7 21.01	7 57.40	23 56 25.7	57 14.7	9.07247	9.1993	2.26	4.45
31 2 32.0	122	5 10 11.20	10 47.95	+24 0 7.7	0 54.6	+9.07268	+9.1764	-2.23	-4.45

REMARKS. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of <i>t</i> in Sidereal Minutes.		Log. Coefficient of <i>t</i> ² .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
May	d h m	d h m s	m s	° ' "	° ' "						
1	2 32.0	122 5 10 11.20	10 47.95	+24 0 7.7	0 54.6	+9.07268	+9.1764	-2.23	-4.45		
2	2 33.9	123 5 13 1.47	13 38.57	24 3 38.0	4 22.8	9.07265	9.1522	2.19	4.45		
3	2 27.8	124 5 15 51.80	16 29.25	24 6 56.6	7 39.2	9.07301	9.1266	2.15	4.45		
4	2 28.7	125 5 18 42.19	19 19.98	24 10 3.5	10 43.9	9.07315	9.0994	2.10	4.45		
5	2 27.6	126 5 21 32.62	22 10.76	24 12 58.7	13 36.8	9.07326	9.0704	-2.04	4.45		
6	2 26.5	127 5 24 23.10	25 1.58	24 15 42.2	16 18.0	9.07334	9.0393		4.45		
7	2 25.4	128 5 27 13.60	27 52.43	24 18 14.0	18 47.5	9.07340	9.0058		4.45		
8	2 24.3	129 5 30 4.13	30 43.30	24 20 34.1	21 5.1	9.07346	8.9694		4.45		
9	2 23.2	130 5 32 54.68	33 34.19	24 22 42.4	23 10.9	9.07349	8.9296		4.45		
10	2 22.1	131 5 35 45.23	36 25.08	24 24 39.0	25 5.0	9.07349	8.8856		4.45		
11	2 21.0	132 5 38 35.78	39 15.96	24 26 23.7	26 47.3	9.07348	8.8366		4.45		
12	2 19.9	133 5 41 26.32	42 6.83	24 27 56.7	28 17.7	9.07344	8.7819		4.45		
13	2 18.8	134 5 44 16.84	44 57.68	24 29 18.0	29 36.3	9.07338	8.7190		4.45		
14	2 17.7	135 5 47 7.33	47 48.49	24 30 27.5	30 43.1	9.07326	8.6454		4.45		
15	2 16.6	136 5 49 57.77	50 39.26	24 31 25.3	31 38.1	9.07313	8.5568		4.45		
16	2 15.5	137 5 52 48.17	53 29.96	24 32 11.3	32 21.3	9.07301	8.4448	+2.08	4.45		
17	2 14.5	138 5 55 38.50	56 20.64	24 32 45.5	32 52.8	9.07283	8.2950	2.15	4.44		
18	2 13.4	139 5 58 28.75	59 11.22	24 33 8.1	33 12.5	9.07264	8.0556	2.22	4.44		
19	2 12.3	140 6 1 18.93	2 1.71	24 33 19.0	33 20.4	9.07243	+7.5449	2.28	4.44		
20	2 11.2	141 6 4 9.02	4 52.12	24 33 18.2	33 16.7	9.07220	-7.5612	2.33	4.44		
21	2 10.1	142 6 6 59.02	7 42.43	24 33 5.8	33 1.3	9.07196	8.1017	2.38	4.44		
22	2 9.0	143 6 9 48.92	10 32.64	24 32 41.8	32 34.3	9.07169	8.3159	2.42	4.44		
23	2 7.9	144 6 12 38.71	13 22.73	24 32 6.1	31 55.6	9.07141	8.4581	2.44	4.44		
24	2 6.7	145 6 15 28.39	16 12.71	24 31 19.0	31 5.3	9.07112	8.5647	2.46	4.44		
25	2 5.6	146 6 18 17.95	19 2.57	24 30 20.4	30 3.5	9.07081	8.6505	2.48	4.44		
26	2 4.5	147 6 21 7.39	21 52.30	24 29 10.2	28 50.1	9.07048	8.7222	2.50	4.44		
27	2 3.4	148 6 23 56.69	24 41.90	24 27 48.5	27 25.2	9.07012	8.7834	2.52	4.44		
28	2 2.3	149 6 26 45.85	27 31.36	24 26 15.3	25 48.8	9.06976	8.8371	2.54	4.44		
29	2 1.2	150 6 29 34.87	30 20.67	24 24 30.6	24 0.9	9.06938	8.8846	2.56	4.43		
30	2 0.1	151 6 32 23.74	33 9.83	24 22 34.5	22 1.5	9.06901	8.9271	2.58	4.43		
31	1 58.9	152 6 35 12.47	35 58.84	24 20 27.1	19 50.7	9.06862	8.9656	2.60	4.43		
June	1 57.8	153 6 38 1.04	38 47.69	24 18 8.4	17 28.6	9.06819	9.0011	2.62	4.43		
2	1 56.7	154 6 40 49.43	41 36.37	24 15 38.4	14 55.2	9.06773	9.0336	2.63	4.43		
3	1 55.6	155 6 43 37.65	44 24.88	24 12 57.2	12 10.5	9.06728	9.0638	2.65	4.43		
4	1 54.4	156 6 46 25.69	47 13.20	24 10 4.8	9 14.5	9.06782	9.0920	2.67	4.43		
5	1 53.3	157 6 49 13.55	50 1.32	24 7 1.2	6 7.4	9.06633	9.1185	2.69	4.43		
6	1 52.2	158 6 52 1.21	52 49.25	24 3 46.5	3 49.2	9.06581	9.1431	2.70	4.43		
7	1 51.0	159 6 54 48.67	55 36.97	24 0 20.8	59 19.9	9.06528	9.1663	2.72	4.42		
8	1 49.9	160 6 57 35.92	58 24.48	23 56 44.1	55 39.6	9.06473	9.1883	2.74	4.42		
9	1 48.7	161 7 0 22.96	1 11.78	23 53 56.5	51 48.3	9.06416	9.2091	2.75	4.42		
10	1 47.6	162 7 3 9.77	3 58.85	23 48 58.0	47 46.1	9.06358	9.2289	2.76	4.42		
11	1 46.4	163 7 5 56.36	6 45.69	23 44 48.7	43 33.1	9.06297	9.2477	2.77	4.41		
12	1 45.2	164 7 8 42.71	9 32.30	23 40 28.6	39 9.4	9.06235	9.2655	2.78	4.41		
13	1 44.1	165 7 11 28.82	12 18.66	23 35 57.9	34 35.0	9.06171	9.2826	2.79	4.41		
14	1 42.9	166 7 14 14.68	15 4.76	23 31 16.5	29 49.9	9.06105	9.2990	2.80	4.41		
15	1 41.7	167 7 17 0.29	17 50.60	23 26 24.6	24 54.2	9.06037	9.3145	2.81	4.40		
16	1 40.5	168 7 19 45.63	20 36.18	23 21 22.3	19 48.1	9.05967	9.3296	2.82	4.40		
17	1 39.3	169 7 22 30.71	23 21.49	23 16 9.5	14 31.6	9.05898	9.3440	2.83	4.40		
18	1 38.1	170 7 25 15.52	26 6.53	23 10 46.4	9 4.7	9.05825	9.3578	2.84	4.39		
19	1 37.0	171 7 28 0.05	28 51.29	23 5 13.1	3 27.5	9.05753	9.3711	2.84	4.39		
20	1 35.8	172 7 30 44.31	31 35.77	22 59 29.6	57 40.2	9.05679	9.3840	2.84	4.39		
21	1 34.6	173 7 33 28.28	34 19.96	22 53 35.9	51 42.7	9.05603	9.3964	2.84	4.38		
22	1 33.4	174 7 36 11.96	37 3.86	22 47 32.2	45 35.1	9.05525	9.4083	2.84	4.38		
23	1 32.2	175 7 38 55.35	39 47.47	22 41 18.5	39 17.5	9.05447	9.4199	2.84	4.38		
24	1 30.9	176 7 41 38.44	42 30.77	22 34 54.9	32 49.9	9.05368	9.4311	2.84	4.38		
25	1 29.7	177 7 44 21.23	45 13.78	22 28 21.4	26 12.5	9.05289	9.4419	2.85	4.37		
26	1 28.5	178 7 47 3.74	47 56.49	22 21 33.2	19 25.4	9.05210	9.4523	2.85	4.37		
27	1 27.3	179 7 49 45.94	50 38.90	22 14 45.3	12 28.6	9.05130	9.4626	2.85	4.36		
28	1 26.0	180 7 52 27.84	53 21.00	22 7 42.7	5 22.1	9.05048	9.4724	2.85	4.36		
29	1 24.8	181 7 55 9.44	56 2.80	22 0 30.6	58 6.0	9.04967	9.4820	2.86	4.35		
30	1 23.5	182 7 57 50.74	58 44.30	21 53 9.0	50 40.4	9.04886	9.4913	2.86	4.35		
31	1 22.3	183 8 0 31.73	1 25.50	+21 45 37.9	43 5.4	+9.04803	-9.5004	+2.86	-4.34		

EXPLANATION. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.				Side- real Date.	Apparent Right Ascension.				Apparent Declination.				Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .			
					At Sidereal Oh.		At Transit.		At Sidereal Oh.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.		
July	d	h	m	d	h	m	s	m	s	^o	[']	["]	^o	[']				
	1	1	22.3	183	8	0	31.73	1	25.50	+21	45	37.9	43	5.4	+9.04803	-9.5004	+2.86	-4.34
	2	1	21.0	184	8	3	12.42	4	6.39	21	37	57.5	35	21.0	9.04721	9.5091	2.87	4.34
	3	1	19.8	185	8	5	52.81	6	46.98	21	30	7.9	27	27.4	9.04639	9.5176	2.87	4.34
	4	1	18.5	186	8	8	32.90	9	27.26	21	22	9.1	19	24.6	9.04555	9.5259	2.87	4.33
	5	1	17.2	187	8	11	12.67	12	7.22	21	14	1.9	11	12.8	9.04470	9.5340	2.87	4.33
	6	1	15.9	188	8	13	52.12	14	46.85	21	5	44.3	2	52.0	9.04384	9.5417	2.87	4.32
	7	1	14.6	189	8	16	31.26	17	26.17	20	57	18.6	54	22.2	9.04296	9.5493	2.88	4.32
	8	1	13.3	190	8	19	10.08	20	5.17	20	48	44.1	45	43.6	9.04212	9.5567	2.89	4.32
	9	1	12.1	191	8	21	48.59	22	43.86	20	40	0.8	36	56.4	9.04123	9.5639	2.90	4.32
	10	1	10.8	192	8	24	26.77	25	22.21	20	31	9.0	28	0.6	9.04032	9.5708	2.90	4.31
	11	1	9.5	193	8	27	4.61	28	0.23	20	22	8.7	18	56.3	9.03940	9.5776	2.90	4.30
	12	1	8.2	194	8	29	42.12	30	37.91	20	13	0.0	9	43.6	9.03849	9.5843	2.90	4.30
	13	1	6.8	195	8	32	19.30	33	15.25	20	3	42.9	0	22.6	9.03758	9.5908	2.90	4.29
	14	1	5.5	196	8	34	56.15	35	52.27	19	54	17.6	50	53.3	9.03668	9.5971	2.90	4.29
	15	1	4.2	197	8	37	32.68	38	28.96	19	44	44.1	41	15.8	9.03576	9.6032	2.90	4.28
	16	1	2.9	198	8	40	8.87	41	5.32	19	35	2.5	31	30.3	9.03483	9.6092	2.90	4.27
	17	1	1.5	199	8	42	44.73	43	41.34	19	25	13.0	21	36.8	9.03391	9.6150	2.89	4.27
	18	1	0.2	200	8	45	20.26	46	17.03	19	15	15.6	11	35.5	9.03299	9.6207	2.89	4.26
	19	0	58.8	201	8	47	55.46	48	52.38	19	5	10.4	1	26.4	9.03207	9.6263	2.89	4.26
	20	0	57.5	202	8	50	30.33	51	27.41	18	54	57.5	51	9.7	9.03114	9.6317	2.89	4.25
	21	0	56.1	203	8	53	4.87	54	2.11	18	44	37.1	40	45.3	9.03023	9.6370	2.88	4.25
	22	0	54.7	204	8	55	39.08	56	36.48	18	34	9.1	30	13.4	9.02931	9.6422	2.88	4.24
	23	0	53.4	205	8	58	12.97	59	10.52	18	23	33.7	19	34.1	9.02840	9.6472	2.87	4.24
	24	0	52.0	206	9	0	46.54	1	44.24	18	12	50.9	8	47.4	9.02749	9.6521	2.87	4.23
	25	0	50.6	207	9	3	19.79	4	17.64	18	2	0.9	57	53.5	9.02650	9.6569	2.86	4.23
	26	0	49.2	208	9	5	52.73	6	50.74	17	51	3.7	46	52.4	9.02573	9.6617	2.86	4.22
	27	0	47.8	209	9	8	25.37	9	23.53	17	39	59.3	35	44.2	9.02488	9.6663	2.85	4.22
	28	0	46.4	210	9	10	57.71	11	56.02	17	28	47.9	24	28.9	9.02402	9.6708	2.85	4.21
	29	0	45.0	211	9	13	29.75	14	28.21	17	17	29.6	13	6.8	9.02317	9.6752	2.85	4.21
30	0	43.6	212	9	16	1.49	17	0.10	17	6	4.5	1	37.8	9.02229	9.6795	2.85	4.20	
Aug.	31	0	42.2	213	9	18	32.92	19	31.69	16	54	32.6	50	2.1	9.02143	9.6838	2.84	4.19
	1	0	40.8	214	9	21	4.06	22	2.98	16	42	54.0	38	19.8	9.02059	9.6879	2.84	4.19
	2	0	39.4	215	9	23	34.00	24	33.97	16	31	8.9	26	30.9	9.01974	9.6919	2.84	4.18
	3	0	37.9	216	9	26	5.45	27	4.66	16	19	17.3	14	35.5	9.01890	9.6958	2.83	4.18
	4	0	36.5	217	9	28	35.71	29	35.06	16	7	19.3	2	33.7	9.01806	9.6996	2.83	4.17
	5	0	35.1	218	9	31	5.68	32	5.18	15	55	15.1	50	25.7	9.01725	9.7033	2.83	4.17
	6	0	33.6	219	9	33	35.37	34	35.02	15	43	4.7	38	11.7	9.01642	9.7070	2.82	4.16
	7	0	32.2	220	9	36	4.78	37	4.57	15	30	48.2	25	51.5	9.01561	9.7106	2.82	4.15
	8	0	30.7	221	9	38	33.91	39	33.84	15	18	25.7	13	25.4	9.01478	9.7140	2.81	4.14
	9	0	29.2	222	9	41	2.75	42	2.83	15	5	57.4	0	53.5	9.01396	9.7174	2.81	4.13
	10	0	27.8	223	9	43	31.32	44	31.55	14	53	23.4	48	15.8	9.01317	9.7206	2.80	4.12
	11	0	26.3	224	9	45	59.62	46	59.99	14	40	43.7	35	32.5	9.01238	9.7238	2.79	4.12
	12	0	24.9	225	9	48	27.65	49	28.16	14	27	58.5	22	43.8	9.01158	9.7270	2.78	4.11
	13	0	23.4	226	9	50	55.40	51	56.05	14	15	7.8	9	49.5	9.01077	9.7301	2.77	4.10
	14	0	21.9	227	9	53	22.88	54	23.67	14	2	11.7	56	49.9	9.00997	9.7330	2.76	4.09
	15	0	20.4	228	9	55	50.09	56	51.02	13	49	10.3	43	45.1	9.00917	9.7359	2.76	4.08
	16	0	18.9	229	9	58	17.03	59	18.11	13	36	3.8	30	35.0	9.00839	9.7387	2.75	4.08
	17	0	17.5	230	10	0	43.71	1	44.94	13	22	52.2	17	19.9	9.00765	9.7415	2.74	4.07
	18	0	16.0	231	10	3	10.15	4	11.53	13	9	35.5	3	59.8	9.00686	9.7443	2.73	4.06
	19	0	14.5	232	10	5	36.36	6	37.89	12	56	13.9	50	34.8	9.00606	9.7469	2.72	4.06
20	0	13.0	233	10	8	2.33	9	4.01	12	42	47.4	37	4.9	9.00527	9.7495	2.70	4.05	
21	0	11.5	234	10	10	28.08	11	29.91	12	29	16.2	23	30.2	9.00449	9.7520	2.69	4.05	
22	0	9.9	235	10	12	53.60	13	55.58	12	15	40.3	9	50.9	9.00372	9.7545	2.69	4.04	
23	0	8.4	236	10	15	18.89	16	21.03	12	1	59.7	56	7.0	9.00297	9.7570	2.68	4.04	
24	0	6.9	237	10	17	43.98	18	46.26	11	48	14.6	42	18.6	9.00228	9.7593	2.68	4.03	
25	0	5.4	238	19	20	8.87	21	11.30	11	34	25.0	28	25.7	9.00158	9.7616	2.68	4.02	
26	0	3.9	239	10	22	33.56	23	36.15	11	20	31.1	14	28.6	9.00178	9.7639	2.67	4.01	
27	0	2.3	240	10	24	58.05	26	0.81	11	6	32.9	0	27.2	9.00120	9.7661	2.67	4.00	
28	0	0.8	241	10	27	22.36	28	25.27	10	52	30.5	46	21.6	9.00063	9.7682	2.66	3.99	
29	23	59.3	242	10	29	46.47	30	49.53	10	38	24.0	32	12.0	9.00005	9.7703	2.65	3.98	
30	23	57.7	243	10	32	10.39	33	13.61	10	24	13.5	17	58.4	8.99947	9.7723	2.64	3.97	
31	23	56.2	244	10	34	34.12	35	37.51	10	9	59.1	3	40.8	8.99889	9.7743	2.63	3.96	
31	23	54.7	245	10	36	57.68	38	1.23	+ 9	55	40.9	49	19.5	+8.99841	-9.7762	+2.62	-3.95	

REMARK. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 23 53.1	246	10 30 21.07	40 24.79	+ 9 41 19.0	34 54.5	+8.99791	-9.7780	+2.60	-3.94
2 23 51.6	247	10 41 44.30	42 48.19	9 26 53.5	20 26.0	8.99744	9.7798	2.58	3.92
3 23 50.0	248	10 44 7.38	45 11.44	9 12 24.5	5 54.1	8.99700	9.7815	2.57	3.91
4 23 48.4	249	10 46 30.32	47 34.55	8 57 52.1	51 18.7	8.99656	9.7832	2.56	3.90
5 23 46.9	250	10 48 53.11	49 57.52	8 43 16.4	36 40.1	8.99613	9.7848	2.54	3.89
6 23 45.3	251	10 51 15.76	52 20.34	8 28 37.5	21 58.3	8.99571	9.7864	2.54	3.88
7 23 43.8	252	10 53 38.28	54 43.03	8 13 55.5	7 13.4	8.99530	9.7879	2.53	3.87
8 23 42.2	253	10 56 0.66	57 5.58	7 59 10.4	52 25.6	8.99489	9.7893	2.52	3.86
9 23 40.6	254	10 58 22.90	59 27.98	7 44 22.4	37 34.8	8.99448	9.7908	2.51	3.84
10 23 39.1	255	11 0 45.00	1 50.25	7 29 31.6	22 41.2	8.99407	9.7921	2.50	3.83
11 23 37.5	256	11 3 6.98	4 12.41	7 14 38.0	7 44.9	8.99368	9.7934	2.49	3.81
12 23 35.9	257	11 5 28.84	6 34.45	6 59 41.8	52 46.0	8.99331	9.7947	2.48	3.80
13 23 34.3	258	11 7 50.58	8 56.38	6 44 43.0	37 44.6	8.99298	9.7959	2.42	3.78
14 23 32.8	259	11 10 12.22	11 18.90	6 29 41.7	22 40.7	8.99266	9.7971	2.37	3.77
15 23 31.2	260	11 12 33.75	13 39.92	6 14 38.0	7 34.4	8.99235	9.7982	2.32	3.74
16 23 29.6	261	11 14 55.19	16 1.55	5 59 32.1	52 25.9	8.99207	9.7993	2.27	3.73
17 23 28.0	262	11 17 16.54	18 23.10	5 44 23.9	37 15.2	8.99184	9.8003	2.22	3.71
18 23 26.4	263	11 19 37.82	20 44.58	5 29 13.6	22 2.4	8.99164	9.8013	2.18	3.70
19 23 24.8	264	11 21 59.05	23 6.01	5 14 1.2	6 47.6	8.99147	9.8023	2.14	3.68
20 23 23.3	265	11 24 20.22	25 27.39	4 58 46.8	51 30.8	8.99131	9.8032	2.10	3.66
21 23 21.7	266	11 26 41.35	27 48.72	4 43 30.5	36 12.1	8.99115	9.8041	2.06	3.64
22 23 20.1	267	11 29 2.41	30 10.00	4 38 12.3	30 51.6	8.99100	9.8050	+2.00	3.62
23 23 18.5	268	11 31 23.44	32 31.24	4 12 52.4	5 29.3	8.99089	9.8058		3.60
24 23 16.9	269	11 33 44.43	34 52.45	3 57 30.8	50 5.5	8.99079	9.8066		3.58
25 23 15.3	270	11 36 5.40	37 13.64	3 42 7.6	34 40.1	8.99072	9.8073		3.56
26 23 13.7	271	11 38 26.34	39 34.80	3 26 42.9	19 13.2	8.99066	9.8080		3.52
27 23 12.1	272	11 40 47.27	41 55.95	3 11 16.9	3 45.1	8.99064	9.8086		3.49
28 23 10.5	273	11 43 8.20	44 17.10	2 55 49.6	48 15.7	8.99064	9.8091		3.42
29 23 9.0	274	11 45 29.13	46 38.27	2 40 21.2	32 45.2	8.99065	9.8096		3.40
30 23 7.4	275	11 47 50.06	48 59.44	2 24 51.7	17 13.6	8.99066	9.8092		3.38
Oct. 1 23 5.8	276	11 50 11.00	51 20.61	2 9 21.1	1 41.1	8.99069	9.8106		3.35
2 23 4.2	277	11 52 31.95	53 41.79	1 53 49.6	46 7.7	8.99072	9.8110		3.28
3 23 2.6	278	11 54 52.91	56 2.99	1 38 17.3	30 35.5	8.99078	9.8113		3.22
4 23 1.0	279	11 57 13.89	58 24.22	1 22 44.3	14 58.6	8.99087	9.8117		3.16
5 22 59.4	280	11 59 34.91	0 45.49	1 7 10.7	59 23.2	8.99098	9.8119		3.08
6 22 57.8	281	12 1 55.97	3 6.79	0 51 36.5	43 47.3	8.99107	9.8122		-3.00
7 22 56.2	282	12 4 17.05	5 28.13	0 36 2.0	28 11.2	8.99118	9.8123		
8 22 54.7	283	12 6 38.18	7 49.52	0 20 27.2	12 34.7	8.99132	9.8124		
9 22 53.1	284	12 8 59.35	10 10.85	+ 0 4 52.3	3 1.9	8.99147	9.8124		
10 22 51.5	285	12 11 20.58	12 32.43	- 0 10 42.7	18 38.4	8.99164	9.8125	-2.08	
11 22 49.9	286	12 13 41.86	14 53.97	0 26 17.7	34 14.9	8.99183	9.8124	2.16	
12 22 48.3	287	12 16 3.21	17 15.69	0 41 52.7	49 51.2	8.99204	9.8124	2.22	
13 22 46.8	288	12 18 24.63	19 37.30	0 57 27.5	5 27.4	8.99227	9.8123	2.26	
14 22 45.2	289	12 20 46.13	21 59.09	1 13 2.0	21 3.3	8.99253	9.8123	2.30	
15 22 43.6	290	12 23 7.72	24 20.97	1 28 36.2	36 38.8	8.99284	9.8120	2.34	+3.00
16 22 42.0	291	12 25 29.42	26 42.95	1 44 10.0	52 13.8	8.99316	9.8118	2.38	3.08
17 22 40.5	292	12 27 51.23	29 5.04	1 59 43.3	7 48.3	8.99350	9.8115	2.42	3.16
18 22 38.9	293	12 30 13.15	31 27.24	2 15 16.0	23 22.2	8.99385	9.8113	2.45	3.23
19 22 37.3	294	12 32 35.18	33 49.56	2 30 48.0	38 55.4	8.99420	9.8109	2.48	3.27
20 22 35.8	295	12 34 57.33	36 12.01	2 46 19.2	54 27.8	8.99457	9.8105	2.50	3.30
21 22 34.2	296	12 37 19.60	38 34.60	3 1 49.6	9 59.3	8.99498	9.8101	2.52	3.33
22 22 32.6	297	12 39 42.02	40 57.34	3 17 19.1	25 29.7	8.99544	9.8097	2.55	3.38
23 22 31.1	298	12 42 4.59	43 20.23	3 32 47.6	40 59.1	8.99591	9.8091	2.57	3.42
24 22 29.5	299	12 44 27.32	45 43.28	3 48 14.9	56 27.3	8.99640	9.8086	2.59	3.46
25 22 28.0	300	12 46 50.21	48 6.49	4 3 41.0	11 54.2	8.99690	9.8080	2.61	3.49
26 22 26.4	301	12 49 13.27	50 29.87	4 19 5.8	27 19.7	8.99741	9.8073	2.62	3.56
27 22 24.8	302	12 51 36.50	52 53.43	4 34 29.1	42 43.7	8.99794	9.8066	2.64	3.58
28 22 23.3	303	12 53 59.91	55 17.18	4 49 50.8	58 6.1	8.99849	9.8058	2.65	3.60
29 22 21.8	304	12 56 23.50	57 41.11	5 5 10.8	13 26.7	8.99904	9.8050	2.66	3.62
30 22 20.2	305	12 58 47.27	0 5.22	5 20 29.1	28 45.5	8.99959	9.8042	2.67	3.64
31 22 18.7	306	13 1 11.23	2 29.53	5 35 45.5	44 2.4	9.00018	9.8033	2.68	3.66
32 22 17.2	307	13 3 35.39	4 54.04	- 5 51 0.9	59 17.2	+9.00078	-9.8023	-2.69	+3.68

REMARKS. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Data.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 22 17.2	307	13 3 25.39	4 54.04	-5 51' 0.0	59 17.2	+9.00078	-9.8023	-2.69	+3.68
2 22 15.6	308	13 5 59.75	7 18.76	6 6 12.3	14 29.9	9.00140	9.8012	2.70	3.70
3 22 14.1	309	13 8 24.32	9 43.68	6 21 22.4	29 40.3	9.00203	9.8002	2.71	3.72
4 22 12.6	310	13 10 49.10	12 8.82	6 36 30.2	44 48.3	9.00267	9.7991	2.72	3.74
5 22 11.1	311	13 13 14.09	14 34.18	6 51 35.7	59 53.9	9.00328	9.7979	2.73	3.77
6 22 9.5	312	13 15 39.30	16 59.76	7 6 38.7	14 56.9	9.00398	9.7967	2.74	3.79
7 22 8.0	313	13 18 4.74	19 25.57	7 21 39.0	29 57.2	9.00465	9.7954	2.75	3.81
8 22 6.5	314	13 20 30.40	21 51.61	7 36 36.6	44 54.7	9.00532	9.7940	2.76	3.83
9 22 5.0	315	13 22 56.29	24 17.88	7 51 31.4	59 49.3	9.00602	9.7926	2.77	3.86
10 22 3.5	316	13 25 22.42	26 44.40	8 6 23.2	14 41.0	9.00675	9.7912	2.78	3.87
11 22 2.0	317	13 27 48.80	29 11.17	8 21 12.0	29 29.6	9.00751	9.7897	2.79	3.88
12 22 0.5	318	13 30 15.44	31 38.21	8 35 57.6	44 14.9	9.00829	9.7881	2.80	3.89
13 21 59.0	319	13 32 42.35	34 5.51	8 50 40.0	58 57.0	9.00909	9.7865	2.81	3.90
14 21 57.5	320	13 35 9.53	36 33.09	9 5 19.1	13 35.7	9.00989	9.7848	2.82	3.91
15 21 56.1	321	13 37 36.98	39 0.94	9 19 54.8	28 10.9	9.01068	9.7831	2.83	3.92
16 21 54.6	322	13 40 4.70	41 29.06	9 34 27.1	42 42.5	9.01147	9.7814	2.84	3.93
17 21 53.1	323	13 42 32.69	43 57.46	9 48 55.7	57 10.5	9.01222	9.7795	2.85	3.94
18 21 51.7	324	13 45 0.96	46 26.17	10 3 20.6	11 34.8	9.01312	9.7776	2.86	3.96
19 21 50.3	325	13 47 29.52	48 55.18	10 17 41.7	25 55.1	9.01401	9.7757	2.87	3.97
20 21 48.8	326	13 49 58.40	51 24.51	10 31 58.9	40 11.3	9.01494	9.7737	2.88	3.99
21 21 47.3	327	13 52 27.60	53 54.16	10 46 12.0	54 23.6	9.01589	9.7716	2.89	4.00
22 21 45.9	328	13 54 57.13	56 24.13	11 0 21.0	8 31.6	9.01683	9.7694	2.90	4.01
23 21 44.5	329	13 57 26.98	58 54.44	11 14 25.8	22 35.3	9.01776	9.7673	2.90	4.02
24 21 43.0	330	13 59 57.15	1 25.07	11 28 26.2	36 34.5	9.01871	9.7650	2.91	4.03
25 21 41.6	331	14 2 27.66	3 56.03	11 42 22.1	50 29.2	9.01968	9.7626	2.91	4.04
26 21 40.2	332	14 4 58.50	6 27.33	11 56 13.4	4 19.1	9.02064	9.7601	2.91	4.05
27 21 38.8	333	14 7 29.68	8 58.97	12 9 59.9	-18 4.3	9.02161	9.7576	2.92	4.06
28 21 37.4	334	14 10 1.19	11 30.95	12 23 41.6	31 44.6	9.02258	9.7551	2.92	4.07
29 21 36.0	335	14 12 33.06	14 3.28	12 37 18.4	45 19.8	9.02356	9.7524	2.93	4.08
30 21 34.6	336	14 15 5.26	16 35.96	12 50 50.1	58 49.8	9.02455	9.7496	2.93	4.09
Dec. 1 21 33.2	337	14 17 37.81	19 8.98	13 4 16.6	12 14.5	9.02553	9.7468	2.93	4.10
2 21 31.8	338	14 20 10.70	21 42.36	13 17 37.8	25 33.9	9.02651	9.7439	2.94	4.11
3 21 30.5	339	14 22 43.94	24 16.10	13 30 53.6	38 47.8	9.02751	9.7409	2.94	4.12
4 21 29.1	340	14 25 17.53	26 50.18	13 44 3.8	51 56.0	9.02851	9.7378	2.95	4.13
5 21 27.7	341	14 27 51.48	29 24.62	13 57 8.4	4 58.5	9.02953	9.7347	2.95	4.14
6 21 26.3	342	14 30 25.79	31 59.43	14 10 7.2	17 55.1	9.03054	9.7314	2.96	4.15
7 21 25.0	343	14 33 0.46	34 34.60	14 23 0.1	30 45.8	9.03155	9.7281	2.96	4.16
8 21 23.6	344	14 35 35.49	37 10.13	14 35 47.0	43 30.4	9.03257	9.7247	2.96	4.17
9 21 22.3	345	14 38 10.89	39 46.03	14 48 27.9	56 8.8	9.03359	9.7212	2.96	4.17
10 21 20.9	346	14 40 46.65	42 22.31	15 1 2.6	8 40.9	9.03464	9.7176	2.96	4.18
11 21 19.6	347	14 43 22.80	44 58.97	15 13 31.0	21 6.6	9.03569	9.7139	2.96	4.19
12 21 18.3	348	14 45 59.33	47 36.01	15 25 52.9	33 25.9	9.03675	9.7101	2.97	4.20
13 21 17.0	349	14 48 36.23	50 13.44	15 38 8.3	45 38.6	9.03780	9.7062	2.97	4.20
14 21 15.7	350	14 51 13.52	52 51.26	15 50 17.1	57 44.5	9.03886	9.7022	2.98	4.21
15 21 14.4	351	14 53 51.19	55 29.47	16 2 19.1	9 43.6	9.04095	9.6981	2.98	4.21
16 21 13.1	352	14 56 29.27	58 8.09	16 14 14.2	21 35.6	9.04105	9.6939	2.98	4.22
17 21 11.8	353	14 59 7.74	0 47.10	16 26 2.3	33 20.5	9.04215	9.6896	2.98	4.22
18 21 10.5	354	15 1 46.62	3 26.52	16 37 43.3	44 58.2	9.04325	9.6851	2.98	4.23
19 21 9.2	355	15 4 25.90	6 6.35	16 49 17.1	56 28.7	9.04436	9.6806	2.98	4.24
20 21 8.0	356	15 7 5.59	8 46.59	17 0 43.6	7 51.9	9.04546	9.6760	2.99	4.24
21 21 6.7	357	15 9 45.68	11 27.24	17 12 2.8	19 7.6	9.04656	9.6713	2.98	4.25
22 21 5.4	358	15 12 26.18	14 8.31	17 23 14.6	30 15.8	9.04767	9.6664	2.98	4.26
23 21 4.2	359	15 15 7.00	16 49.78	17 34 18.7	41 16.2	9.04877	9.6614	2.98	4.27
24 21 3.0	360	15 17 48.41	19 31.67	17 45 15.1	52 8.8	9.04988	9.6562	2.98	4.28
25 21 1.7	361	15 20 30.15	22 13.97	17 56 3.6	2 53.4	9.05098	9.6509	2.98	4.28
26 21 0.5	362	15 23 12.29	24 56.67	18 6 44.1	13 29.8	9.05206	9.6453	2.98	4.29
27 20 59.3	363	15 25 54.83	27 39.78	18 17 16.3	23 57.9	9.05315	9.6396	2.98	4.30
28 20 58.0	364	15 28 37.78	30 23.30	18 27 40.2	34 17.6	9.05423	9.6338	2.98	4.30
29 20 56.8	365	15 31 21.13	33 7.22	18 37 55.8	44 28.8	9.05529	9.6280	2.98	4.30
30 20 55.6	366	15 34 4.88	35 51.53	18 48 3.0	54 31.5	9.05634	9.6219	2.98	4.31
31 20 54.4	367	15 36 49.02	38 36.24	18 58 1.6	4 25.6	9.05738	9.6156	2.98	4.31
32 20 53.3	368	15 39 33.56	41 21.35	-19 7 51.6	14 10.9	+9.05842	-9.6092	-2.98	+4.31

REMARK.—The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Jan. 0 15 12.2	0	9 56 2.15	55 56.38	+13 37 53.9	38 31.0	-7.9831	+8.7896	-3.92	+3.93
1 15 8.0	1	9 55 47.96	55 41.89	13 39 24.1	40 2.6	8.0043	8.8064	3.22	3.92
2 15 3.7	2	9 55 33.09	55 26.73	13 40 58.0	41 37.9	8.0245	8.8221	3.21	3.92
3 14 59.5	3	9 55 17.52	55 10.88	13 42 35.4	43 16.7	8.0434	8.8373	3.21	3.91
4 14 55.3	4	9 55 1.27	54 54.35	13 44 16.1	44 58.8	8.0615	8.8524	3.20	3.90
5 14 51.1	5	9 54 44.35	54 37.15	13 46 0.9	46 44.3	8.0787	8.8659	3.20	3.89
6 14 46.9	6	9 54 26.76	54 19.29	13 47 47.6	48 33.1	8.0950	8.8796	3.19	3.88
7 14 42.7	7	9 54 8.52	54 0.79	13 49 38.3	50 25.0	8.1102	8.8919	3.18	3.87
8 14 38.5	8	9 53 49.64	53 41.65	13 51 32.1	52 20.0	8.1251	8.9034	3.17	3.86
9 14 34.2	9	9 53 30.12	53 21.88	13 53 28.9	54 18.0	8.1392	8.9146	3.16	3.85
10 14 29.9	10	9 53 9.98	53 1.50	13 55 28.7	56 19.0	8.1520	8.9254	3.15	3.84
11 14 25.6	11	9 52 49.24	52 40.52	13 57 31.4	58 22.9	8.1648	8.9353	3.14	3.82
12 14 21.3	12	9 52 27.90	52 18.94	13 59 36.9	0 29.5	8.1767	8.9454	3.13	3.80
13 14 17.0	13	9 52 5.98	51 56.79	14 1 45.2	2 38.8	8.1884	8.9546	3.12	3.78
14 14 12.7	14	9 51 43.49	51 34.09	14 3 56.1	4 50.6	8.1988	8.9625	3.11	3.76
15 14 8.4	15	9 51 20.46	51 10.84	14 6 9.4	7 4.9	8.2092	8.9703	3.10	3.74
16 14 4.1	16	9 50 56.89	50 47.07	14 8 25.1	9 21.6	8.2188	8.9783	3.09	3.72
17 13 59.8	17	9 50 32.80	50 22.78	14 10 43.2	11 40.5	8.2261	8.9854	3.07	3.69
18 13 55.4	18	9 50 8.20	49 57.09	14 13 3.5	14 1.6	8.2369	8.9930	3.05	3.67
19 13 51.1	19	9 49 43.12	49 32.73	14 15 25.9	16 24.8	8.2449	8.9984	3.03	3.64
20 13 46.7	20	9 49 17.58	49 7.01	14 17 50.3	18 49.9	8.2527	9.0039	3.01	3.62
21 13 42.3	21	9 48 51.59	48 40.85	14 20 16.5	21 16.8	8.2601	9.0093	3.00	3.59
22 13 37.9	22	9 48 25.17	48 14.26	14 22 44.5	23 45.5	8.2670	9.0146	2.98	3.56
23 13 33.5	23	9 47 58.33	47 47.26	14 25 14.2	26 15.8	8.2736	9.0194	2.96	3.53
24 13 29.1	24	9 47 31.09	47 19.87	14 27 45.5	28 47.6	8.2800	9.0234	2.93	3.50
25 13 24.7	25	9 47 3.47	46 52.11	14 30 18.2	31 20.8	8.2855	9.0275	2.91	3.47
26 13 20.3	26	9 46 35.50	46 24.00	14 32 52.3	33 55.4	8.2911	9.0313	2.88	3.44
27 13 15.9	27	9 46 7.18	45 55.55	14 35 27.7	36 31.2	8.2964	9.0347	2.86	3.41
28 13 11.5	28	9 45 38.53	45 26.79	14 38 4.2	39 8.1	8.3010	9.0376	2.84	3.37
29 13 7.1	29	9 45 9.58	44 57.73	14 40 41.7	41 45.9	8.3055	9.0403	2.81	3.33
30 13 2.7	30	9 44 40.34	44 28.39	14 43 20.1	44 24.5	8.3097	9.0426	2.78	3.28
31 12 58.3	31	9 44 10.84	43 58.80	14 45 59.3	47 3.0	8.3132	9.0448	2.74	3.23
Feb. 1 12 53.9	32	9 43 41.10	43 28.97	14 48 30.2	49 44.0	8.3167	9.0463	2.69	3.16
2 12 49.5	33	9 43 11.13	42 28.93	14 51 19.6	52 24.6	8.3197	9.0475	2.64	3.04
3 12 45.0	34	9 42 40.96	42 28.70	14 54 0.5	55 5.6	8.3225	9.0484	2.58	+2.86
4 12 40.6	35	9 42 10.61	41 58.30	14 56 41.7	57 46.9	8.3251	9.0495	2.50	
5 12 36.2	36	9 41 40.10	41 27.75	14 59 23.2	0 28.3	8.3270	9.0500	2.41	
6 12 31.8	37	9 41 9.46	40 57.07	15 2 4.8	3 9.7	8.3288	9.0500	2.30	
7 12 27.3	38	9 40 38.71	40 26.29	15 4 46.3	5 51.1	8.3300	9.0495	2.16	
8 12 22.9	39	9 40 7.88	39 55.44	15 7 27.6	8 32.3	8.3312	9.0489	-2.00	-2.86
9 12 18.5	40	9 39 36.98	39 24.54	15 10 8.6	11 13.1	8.3319	9.0479		3.00
10 12 14.0	41	9 39 6.04	38 53.60	15 12 49.2	13 53.5	8.3325	9.0468		3.12
11 12 9.5	42	9 38 35.08	38 22.65	15 15 29.3	16 33.3	8.3326	9.0453		3.22
12 12 5.0	43	9 38 4.13	37 51.72	15 18 8.7	19 12.3	8.3319	9.0430	+2.00	3.31
13 12 0.5	44	9 37 33.22	37 20.84	15 20 47.2	21 50.4	8.3316	9.0403	2.16	3.38
14 11 56.0	45	9 37 2.35	36 50.09	15 23 24.7	24 27.6	8.3306	9.0375	2.28	3.43
15 11 51.6	46	9 36 31.56	36 19.28	15 26 1.3	27 3.7	8.3296	9.0346	2.38	3.47
16 11 47.1	47	9 36 0.87	35 48.65	15 28 36.8	29 36.7	8.3280	9.0316	2.46	3.50
17 11 42.6	48	9 35 30.32	35 18.16	15 31 11.1	32 12.4	8.3258	9.0283	2.55	3.52
18 11 38.2	49	9 34 59.91	34 47.83	15 33 44.1	34 44.7	8.3234	9.0241	2.61	3.54
19 11 33.8	50	9 34 29.67	34 17.67	15 36 15.6	37 15.6	8.3208	9.0199	2.65	3.56
20 11 29.3	51	9 33 59.62	33 47.71	15 38 45.6	39 44.9	8.3179	9.0154	2.70	3.58
21 11 24.9	52	9 33 29.79	33 17.98	15 41 14.0	42 12.6	8.3147	9.0107	2.74	3.61
22 11 20.5	53	9 33 0.19	32 48.49	15 43 40.7	44 38.5	8.3111	9.0054	2.78	3.64
23 11 16.1	54	9 32 30.84	32 19.25	15 46 5.6	47 2.6	8.3073	9.0000	2.81	3.66
24 11 11.7	55	9 32 1.76	31 50.29	15 48 28.6	49 24.7	8.3033	8.9942	2.84	3.69
25 11 7.3	56	9 31 32.97	31 21.63	15 50 49.6	51 44.8	8.2985	8.9877	2.87	3.70
26 11 2.9	57	9 31 4.50	30 53.30	15 53 8.5	54 2.8	8.2936	8.9809	2.90	3.72
27 10 58.5	58	9 30 36.36	30 35.31	15 55 25.2	56 18.7	8.2883	8.9736	2.92	3.74
28 10 54.1	59	9 30 8.57	29 57.67	15 57 39.7	58 32.3	8.2827	8.9659	2.95	3.76
29 10 49.7	60	9 29 41.15	29 30.41	15 59 51.9	0 43.5	8.2768	8.9589	2.97	3.78
30 10 45.3	61	9 29 14.11	29 3.54	+16 2 1.7	2 52.3	-8.2704	+8.9505	+2.99	-3.79

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh	At Transit	At Sidereal Oh	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 10 49.7	60	9 29 41.15	29 30.41	+15 59 51.9	0 43.5	-8.2768	+8.9589	+2.97	-3.78
2 10 45.3	61	9 29 14.11	29 3.54	16 2 1.7	2 52.3	8.2704	8.9505	2.99	3.79
3 10 41.0	62	9 28 47.48	28 37.09	16 4 9.0	4 58.6	8.2635	8.9420	3.01	3.80
4 10 36.6	63	9 28 21.28	28 11.07	16 6 13.8	7 2.3	8.2563	8.9336	3.02	3.81
5 10 32.2	64	9 27 55.52	27 45.49	16 8 16.1	9 3.5	8.2488	8.9244	3.04	3.82
6 10 27.9	65	9 27 30.21	27 20.37	16 10 15.7	11 1.9	8.2409	8.9143	3.06	3.83
7 10 23.6	66	9 27 5.38	26 55.74	16 12 12.5	12 57.6	8.2322	8.9040	3.08	3.84
8 10 19.2	67	9 26 41.05	26 31.69	16 14 6.5	14 50.5	8.2232	8.8929	3.10	3.85
9 10 14.9	68	9 26 17.23	26 8.01	16 15 57.6	16 40.5	8.2136	8.8819	3.11	3.86
10 10 10.6	69	9 25 53.94	25 44.93	16 17 45.8	18 27.5	8.2038	8.8698	3.12	3.86
11 10 6.3	70	9 25 31.19	25 22.40	16 19 31.0	20 11.5	8.1932	8.8575	3.13	3.87
12 10 2.0	71	9 25 9.00	25 0.44	16 21 13.2	21 52.5	8.1822	8.8445	3.14	3.88
13 9 57.7	72	9 24 47.39	24 39.05	16 22 52.3	23 30.3	8.1705	8.8306	3.15	3.88
14 9 53.4	73	9 24 26.35	24 18.26	16 24 28.2	25 5.0	8.1584	8.8161	3.16	3.89
15 9 49.2	74	9 24 5.92	23 58.08	16 26 0.9	26 36.5	8.1452	8.8011	3.17	3.89
16 9 44.9	75	9 23 46.11	23 38.52	16 27 30.4	28 4.7	8.1316	8.7858	3.17	3.89
17 9 40.6	76	9 23 26.92	23 19.58	16 28 56.7	29 29.7	8.1177	8.7696	3.18	3.90
18 9 36.4	77	9 23 8.36	23 1.28	16 30 19.7	30 51.3	8.1028	8.7515	3.19	3.90
19 9 32.2	78	9 22 50.45	22 43.63	16 31 39.3	32 9.6	8.0868	8.7334	3.19	3.90
20 9 28.0	79	9 22 33.19	22 26.63	16 32 55.6	33 24.6	8.0700	8.7149	3.20	3.91
21 9 23.8	80	9 22 16.60	22 10.30	16 34 8.6	34 36.2	8.0524	8.6946	3.21	3.91
22 9 19.6	81	9 22 0.68	21 54.65	16 35 18.2	35 44.4	8.0344	8.6728	3.21	3.91
23 9 15.4	82	9 21 45.43	21 39.68	16 36 24.3	36 49.2	8.0148	8.6505	3.22	3.92
24 9 11.2	83	9 21 30.87	21 25.39	16 37 37.0	37 50.6	7.9945	8.6269	3.22	3.92
25 9 7.0	84	9 21 17.00	21 11.80	16 38 26.3	38 48.5	7.9725	8.6013	3.22	3.92
26 9 2.9	85	9 21 3.83	20 58.90	16 39 22.1	39 43.0	7.9495	8.5756	3.23	3.93
27 8 58.8	86	9 20 51.36	20 46.70	16 40 14.6	40 34.1	7.9249	8.5475	3.23	3.93
28 8 54.7	87	9 20 39.60	20 35.21	16 41 3.7	41 21.8	7.8987	8.5174	3.23	3.93
29 8 50.6	88	9 20 28.55	20 24.44	16 41 49.3	42 6.0	7.8710	8.4825	3.23	3.93
30 8 46.5	89	9 20 18.21	20 14.38	16 42 31.3	42 46.7	7.8407	8.4458	3.24	3.93
31 8 42.4	90	9 20 8.59	20 5.05	16 43 9.8	43 23.9	7.8087	8.4080	3.24	3.94
Apr. 1 8 38.3	91	9 19 59.69	19 56.44	16 43 44.9	43 57.6	7.7725	8.3640	3.24	3.94
2 8 34.2	92	9 19 51.53	19 48.56	16 44 16.5	44 27.9	7.7331	8.3187	3.25	3.94
3 8 30.2	93	9 19 44.11	19 41.42	16 44 44.7	44 54.7	7.6904	8.2632	3.25	3.94
4 8 26.2	94	9 19 37.42	19 35.02	16 45 9.3	45 17.9	7.6423	8.2003	3.25	3.94
5 8 22.2	95	9 19 31.47	19 29.36	16 45 30.3	45 37.5	7.5886	8.1249	3.25	3.94
6 8 18.2	96	9 19 26.26	19 24.44	16 45 47.8	45 53.7	7.5289	8.0417	3.25	3.94
7 8 14.2	97	9 19 21.80	19 20.27	16 46 1.9	46 6.4	7.4523	7.9350	3.26	3.93
8 8 10.2	98	9 19 18.09	19 16.84	16 46 12.5	46 15.6	7.3659	7.7836	3.26	3.93
9 8 6.2	99	9 19 15.12	19 14.16	16 46 19.5	46 21.2	7.2658	7.5618	3.26	3.93
10 8 2.2	100	9 19 12.90	19 12.23	16 46 23.0	46 23.4	7.1074	+7.0846	3.26	3.93
11 7 58.3	101	9 19 11.43	19 11.04	16 46 23.0	46 22.1	6.8849	-7.0846	3.26	3.93
12 7 54.4	102	9 19 10.70	19 10.60	16 46 19.5	46 17.2	-6.3918	7.5618	3.26	3.93
13 7 50.5	103	9 19 10.72	19 10.91	16 46 12.5	46 8.8	+6.4437	7.7836	3.26	3.92
14 7 46.6	104	9 19 11.49	19 11.97	16 46 2.0	45 57.0	6.8985	7.9332	3.25	3.92
15 7 42.7	105	9 19 13.00	19 13.77	16 45 48.0	45 41.7	7.1170	8.0347	3.25	3.92
16 7 38.8	106	9 19 15.25	19 16.30	16 45 30.7	45 23.0	7.2582	8.1193	3.25	3.92
17 7 34.9	107	9 19 18.23	19 19.58	16 45 10.0	45 0.9	7.3672	8.1938	3.25	3.91
18 7 31.0	108	9 19 21.95	19 23.59	16 44 45.8	44 35.4	7.4533	8.2549	3.24	3.91
19 7 27.2	109	9 19 26.40	19 28.32	16 44 18.2	44 6.5	7.5237	8.3086	3.24	3.91
20 7 23.4	110	9 19 31.57	19 33.77	16 43 47.2	43 34.2	7.5843	8.3575	3.24	3.91
21 7 19.5	111	9 19 37.46	19 39.94	16 43 12.8	42 58.6	7.6375	8.3973	3.24	3.91
22 7 15.7	112	9 19 44.07	19 46.83	16 42 35.2	42 19.7	7.6855	8.4354	3.23	3.90
23 7 11.9	113	9 19 51.40	19 54.43	16 41 54.3	41 37.5	7.7270	8.4710	3.23	3.90
24 7 8.1	114	9 19 59.43	20 2.74	16 41 10.1	40 52.1	7.7648	8.5020	3.23	3.90
25 7 4.3	115	9 20 8.16	20 11.75	16 40 22.7	40 3.4	7.7997	8.5320	3.23	3.90
26 7 0.5	116	9 20 17.59	20 21.46	16 39 32.0	39 11.5	7.8324	8.5601	3.22	3.90
27 6 56.7	117	9 20 27.72	20 31.86	16 38 38.1	38 16.3	7.8613	8.5859	3.22	3.89
28 6 53.0	118	9 20 38.53	20 42.94	16 37 41.0	37 18.0	7.8892	8.6106	3.21	3.89
29 6 49.2	119	9 20 50.03	20 54.70	16 36 40.7	36 16.5	7.9150	8.6326	3.21	3.89
30 6 45.5	120	9 21 2.21	21 7.15	16 35 37.3	35 11.9	7.9395	8.6545	3.21	3.88
31 6 41.8	121	9 21 15.07	21 20.27	+16 34 30.7	34 4.0	+7.9618	-8.6757	+3.21	-3.88

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.				Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .							
					At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.						
May	d	h	m	d	h	m	s	m	s	°	'	"	°	'	"			
	1	6	41.8	121	9	21	15.07	21	20.27	+16	34	30.7	34	4.0	+7.9618	-8.6757	+3.21	-3.88
	2	6	38.1	122	9	21	28.59	21	34.05	16	33	20.9	32	52.9	7.9834	8.6350	3.20	3.88
	3	6	34.4	123	9	21	42.78	21	48.50	16	32	8.0	31	38.8	8.0033	8.7132	3.20	3.87
	4	6	30.7	124	9	21	57.62	22	3.60	16	30	52.0	30	21.5	8.0227	8.7318	3.20	3.87
	5	6	27.0	125	9	22	13.12	22	19.36	16	29	32.8	29	1.1	8.0410	8.7490	3.19	3.87
	6	6	23.4	126	9	22	29.27	22	35.77	16	28	10.5	27	37.6	8.0585	8.7648	3.19	3.86
	7	6	19.7	127	9	22	46.07	22	52.82	16	26	45.2	26	11.0	8.0751	8.7799	3.19	3.86
	8	6	16.1	128	9	23	3.51	23	10.51	16	25	16.9	24	41.5	8.0913	8.7954	3.19	3.86
	9	6	12.5	129	9	23	21.59	23	28.83	16	23	45.5	23	8.9	8.1061	8.8096	3.18	3.85
	10	6	8.9	130	9	23	40.29	23	47.78	16	22	11.1	21	33.3	8.1206	8.8236	3.18	3.85
	11	6	5.3	131	9	23	59.61	24	7.34	16	20	33.7	19	54.7	8.1344	8.8364	3.17	3.84
	12	6	1.7	132	9	24	19.54	24	27.62	16	18	53.4	18	13.2	8.1478	8.8494	3.17	3.84
	13	5	58.1	133	9	24	40.08	24	48.30	16	17	10.1	16	28.8	8.1608	8.8617	3.16	3.84
	14	5	54.5	134	9	25	1.22	25	9.67	16	15	23.9	14	41.4	8.1728	8.8739	3.15	3.83
	15	5	50.9	135	9	25	22.95	25	31.63	16	13	34.8	12	51.1	8.1842	8.8852	3.15	3.83
	16	5	47.3	136	9	25	45.25	25	54.17	16	11	42.9	10	58.1	8.1956	8.8962	3.14	3.83
	17	5	43.8	137	9	26	8.13	26	17.28	16	9	48.1	9	2.2	8.2065	8.9070	3.14	3.82
	18	5	40.3	138	9	26	31.58	26	40.06	16	7	50.5	7	3.5	8.2169	8.9169	3.14	3.82
	19	5	36.7	139	9	26	55.59	27	5.20	16	5	50.2	5	2.0	8.2262	8.9270	3.13	3.82
	20	5	33.2	140	9	27	20.16	27	29.98	16	3	47.1	2	57.8	8.2368	8.9366	3.13	3.81
	21	5	29.7	141	9	27	45.27	27	55.31	16	1	41.3	0	50.9	8.2460	8.9459	3.12	3.81
	22	5	26.2	142	9	28	10.91	28	21.18	15	59	32.8	58	41.3	8.2550	8.9551	3.11	3.81
	23	5	22.7	143	9	28	37.08	28	47.57	15	57	21.6	56	29.0	8.2639	8.9641	3.11	3.80
	24	5	19.2	144	9	29	3.78	29	14.48	15	55	7.7	54	14.1	8.2725	8.9725	3.10	3.80
	25	5	15.7	145	9	29	31.00	29	41.91	15	52	51.2	51	56.5	8.2805	8.9809	3.09	3.80
	26	5	12.3	146	9	29	58.72	30	9.84	15	50	32.1	49	36.3	8.2883	8.9887	3.08	3.79
	27	5	8.8	147	9	30	26.94	30	38.27	15	48	10.4	47	13.5	8.2958	8.9973	3.07	3.79
	28	5	5.3	148	9	30	55.65	31	7.19	15	45	46.0	44	48.1	8.3032	9.0049	3.07	3.79
	29	5	1.9	149	9	31	24.86	31	36.59	15	43	19.1	42	20.1	8.3106	9.0124	3.06	3.78
	30	4	58.5	150	9	31	54.55	32	6.48	15	40	49.7	39	49.6	8.3177	9.0198	3.06	3.78
June	1	4	55.0	151	9	32	24.72	32	36.86	15	38	17.7	37	16.6	8.3248	9.0270	3.05	3.78
	2	4	51.6	152	9	32	55.37	33	7.70	15	35	43.2	34	41.0	8.3313	9.0340	3.04	3.77
	3	4	48.2	153	9	33	26.48	33	39.00	15	33	6.2	32	2.9	8.3377	9.0410	3.04	3.77
	4	4	44.8	154	9	33	58.05	34	10.76	15	30	26.7	29	22.4	8.3441	9.0478	3.03	3.77
	5	4	41.4	155	9	34	30.08	34	42.98	15	27	44.7	26	39.4	8.3502	9.0542	3.02	3.76
	6	4	38.0	156	9	35	2.55	35	15.63	15	25	0.3	23	54.0	8.3560	9.0606	3.01	3.76
	7	4	34.6	157	9	35	35.46	35	48.72	15	22	13.4	21	6.1	8.3619	9.0669	3.00	3.75
	8	4	31.3	158	9	36	8.81	36	22.25	15	19	24.2	18	15.8	8.3676	9.0732	2.99	3.75
	9	4	27.9	159	9	36	42.59	36	56.19	15	16	32.6	15	23.1	8.3728	9.0792	2.99	3.75
	10	4	24.6	160	9	37	16.77	37	30.55	15	13	38.6	12	28.1	8.3779	9.0850	2.98	3.75
	11	4	21.2	161	9	37	51.35	38	5.32	15	10	42.3	9	30.8	8.3829	9.0907	2.98	3.74
	12	4	17.9	162	9	38	26.33	38	40.49	15	7	43.7	6	31.1	8.3880	9.0963	2.97	3.74
	13	4	14.5	163	9	39	1.71	39	16.05	15	4	42.8	3	29.2	8.3928	9.1019	2.97	3.74
	14	4	11.2	164	9	39	37.48	39	52.00	15	1	39.6	0	25.1	8.3976	9.1071	2.96	3.73
	15	4	7.9	165	9	40	13.64	40	28.33	14	58	34.2	57	18.8	8.4022	9.1122	2.96	3.73
	16	4	4.6	166	9	40	50.18	41	5.04	14	55	26.6	54	10.3	8.4067	9.1172	2.95	3.72
	17	4	1.3	167	9	41	27.09	41	42.11	14	52	16.9	50	59.6	8.4110	9.1222	2.94	3.72
	18	3	58.0	168	9	42	4.35	42	19.53	14	49	5.0	47	46.8	8.4151	9.1270	2.93	3.71
	19	3	54.7	169	9	42	41.98	42	57.30	14	45	50.9	44	31.9	8.4191	9.1317	2.92	3.71
	20	3	51.4	170	9	43	19.94	43	35.42	14	42	34.8	41	14.8	8.4231	9.1364	2.91	3.71
	21	3	48.1	171	9	43	58.25	44	13.88	14	39	16.6	37	55.6	8.4268	9.1410	2.90	3.70
	22	3	44.8	172	9	44	36.89	44	52.66	14	35	56.3	34	34.4	8.4304	9.1456	2.89	3.70
	23	3	41.5	173	9	45	15.85	45	31.77	14	32	33.9	31	11.1	8.4340	9.1500	2.89	3.69
	24	3	38.2	174	9	45	55.13	46	11.20	14	29	9.5	27	45.8	8.4376	9.1543	2.88	3.69
	25	3	34.9	175	9	46	34.73	46	50.94	14	25	43.1	24	18.5	8.4411	9.1584	2.87	3.68
	26	3	31.6	176	9	47	14.64	47	30.99	14	22	14.8	20	49.2	8.4443	9.1624	2.86	3.68
	27	3	28.3	177	9	47	54.85	48	11.34	14	18	44.5	17	18.0	8.4475	9.1665	2.86	3.67
	28	3	25.1	178	9	48	35.36	48	52.00	14	15	12.2	13	44.8	8.4506	9.1705	2.85	3.67
	29	3	21.8	179	9	49	16.16	49	32.95	14	11	38.0	10	9.7	8.4538	9.1744	2.84	3.66
	30	3	19.6	180	9	49	57.25	50	14.18	14	8	1.9	6	32.7	8.4569	9.1782	2.84	3.66
	31	3	16.4	181	9	50	38.63	50	55.69	14	4	23.9	2	53.8	8.4599	9.1820	2.83	3.65
32	3	12.2	182	9	51	20.29	51	37.48	+14	0	44.0	59	13.1	+8.4626	-9.1855	+2.82	-3.64	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d	h m	d	h m s	m s	° ' "	° ' "				
1	3	12.2	182	9 51 20.29	51 37.48	+14 0 44.0	59 13.1	+8.4626	-9.1855	+2.82	-3.64
2	3	8.9	183	9 52 2.22	52 19.55	13 57 2.3	55 30.5	8.4655	9.1891	2.80	3.64
3	3	5.7	184	9 52 44.42	53 1.87	13 53 18.7	51 46.1	8.4682	9.1928	2.79	3.63
4	3	2.5	185	9 53 26.88	53 44.46	13 49 33.3	47 59.9	8.4710	9.1963	2.77	3.63
5	2	59.3	186	9 54 9.60	54 27.31	13 45 46.1	44 11.8	8.4736	9.1997	2.76	3.62
6	2	56.0	187	9 54 52.57	55 10.41	13 41 57.1	40 21.9	8.4761	9.2031	2.75	3.62
7	2	52.8	188	9 55 35.79	55 53.74	13 38 6.3	36 30.3	8.4785	9.2064	2.74	3.61
8	2	49.6	189	9 56 19.24	56 37.31	13 34 13.8	32 37.0	8.4808	9.2096	2.73	3.60
9	2	46.4	190	9 57 2.92	57 21.12	13 30 19.6	28 42.1	8.4831	9.2127	2.72	3.60
10	2	43.2	191	9 57 46.83	58 5.14	13 26 23.8	24 45.5	8.4855	9.2157	2.71	3.59
11	2	40.0	192	9 58 30.97	58 49.38	13 22 26.4	20 47.2	8.4875	9.2187	2.70	3.59
12	2	36.8	193	9 59 15.32	59 33.84	13 18 27.4	16 47.3	8.4896	9.2217	2.69	3.58
13	2	33.6	194	9 59 59.88	0 18.50	13 14 26.7	12 45.8	8.4915	9.2246	2.68	3.57
14	2	30.4	195	10 0 44.64	1 3.37	13 10 24.4	8 42.8	8.4934	9.2273	2.67	3.56
15	2	27.2	196	10 1 29.59	1 48.43	13 6 20.6	4 38.3	8.4952	9.2300	2.66	3.56
16	2	24.0	197	10 2 14.73	2 33.68	13 2 15.3	0 32.2	8.4971	9.2327	2.65	3.55
17	2	20.9	198	10 3 0.06	3 19.11	12 58 8.5	56 24.7	8.4989	9.2353	2.64	3.55
18	2	17.7	199	10 3 45.57	4 4.72	12 54 0.3	52 15.7	8.5006	9.2378	2.62	3.54
19	2	14.5	200	10 4 31.26	4 50.50	12 49 50.6	48 5.3	8.5023	9.2403	2.61	3.53
20	2	11.3	201	10 5 17.12	5 36.45	12 45 39.5	43 53.5	8.5038	9.2426	2.59	3.52
21	2	8.2	202	10 6 3.14	6 22.57	12 41 27.1	39 40.3	8.5053	9.2449	2.58	3.52
22	2	5.0	203	10 6 49.32	7 8.85	12 37 13.3	35 25.8	8.5068	9.2473	2.57	3.51
23	2	1.9	204	10 7 35.66	7 55.27	12 32 58.1	31 9.9	8.5083	9.2496	2.56	3.50
24	1	58.7	205	10 8 22.15	8 41.85	12 28 41.5	26 52.7	8.5098	9.2518	2.55	3.49
25	1	55.6	206	10 9 8.79	9 28.58	12 24 23.7	22 34.2	8.5111	9.2540	2.54	3.49
26	1	52.4	207	10 9 55.58	10 15.45	12 20 4.6	18 14.4	8.5123	9.2562	2.53	3.48
27	1	49.3	208	10 10 42.50	11 2.46	12 15 44.2	13 53.3	8.5136	9.2582	2.51	3.47
28	1	46.1	209	10 11 29.56	11 49.61	12 11 22.5	9 30.9	8.5149	9.2602	2.49	3.47
29	1	43.0	210	10 12 16.76	12 36.89	12 6 59.5	5 7.3	8.5161	9.2623	2.48	3.46
30	1	39.8	211	10 13 4.09	13 24.29	12 2 35.4	0 42.5	8.5173	9.2643	2.47	3.45
31	1	36.7	212	10 13 51.54	14 11.81	11 58 10.1	56 16.6	8.5184	9.2662	2.46	3.44
Aug. 1	1	33.5	213	10 14 39.10	14 59.45	11 53 43.6	51 49.6	8.5194	9.2681	2.44	3.43
2	1	30.4	214	10 15 26.78	15 47.21	11 49 16.0	47 21.4	8.5204	9.2700	2.42	3.42
3	1	27.2	215	10 16 14.57	16 35.06	11 44 47.3	42 52.1	8.5214	9.2718	2.40	3.41
4	1	24.1	216	10 17 2.46	17 23.12	11 40 17.5	38 21.7	8.5224	9.2736	2.38	3.40
5	1	21.0	217	10 17 50.46	18 11.08	11 35 46.6	33 50.2	8.5232	9.2752	2.36	3.38
6	1	17.9	218	10 18 38.54	18 59.24	11 31 14.7	29 17.8	8.5240	9.2768	2.34	3.37
7	1	14.7	219	10 19 26.71	19 47.47	11 26 41.8	24 44.3	8.5248	9.2784	2.32	3.36
8	1	11.6	220	10 20 14.97	20 35.80	11 22 7.9	20 9.8	8.5255	9.2799	2.29	3.35
9	1	8.5	221	10 21 3.31	21 24.19	11 17 33.1	15 34.5	8.5261	9.2814	2.26	3.34
10	1	5.4	222	10 21 51.72	22 12.66	11 12 57.4	10 58.4	8.5268	9.2827	2.23	3.33
11	1	2.2	223	10 22 40.20	23 1.20	11 8 20.9	6 21.4	8.5275	9.2839	2.20	3.32
12	0	59.1	224	10 23 28.75	23 49.80	11 3 43.6	1 43.5	8.5281	9.2854	2.16	3.30
13	0	56.0	225	10 24 17.36	24 38.46	10 59 5.4	57 4.8	8.5286	9.2865	2.12	3.28
14	0	52.9	226	10 25 6.02	25 27.17	10 54 26.4	52 25.3	8.5290	9.2877	2.08	3.26
15	0	49.7	227	10 25 54.72	26 15.92	10 49 46.6	47 45.1	8.5294	9.2888	2.03	3.27
16	0	46.6	228	10 26 43.47	27 4.71	10 45 6.2	43 4.2	8.5298	9.2899	1.98	3.25
17	0	43.5	229	10 27 32.26	27 53.55	10 40 25.1	38 22.6	8.5302	9.2910	1.92	3.23
18	0	40.4	230	10 28 21.10	28 42.43	10 35 43.3	33 40.3	8.5305	9.2920	1.86	3.22
19	0	37.2	231	10 29 9.97	29 31.34	10 31 0.8	28 57.3	8.5308	9.2930	1.80	3.20
20	0	34.1	232	10 29 58.87	30 20.28	10 26 17.7	24 13.8	8.5311	9.2940	1.74	3.18
21	0	31.0	233	10 30 47.80	31 9.24	10 21 34.0	19 29.7	8.5313	9.2950	+1.68	3.16
22	0	27.9	234	10 31 36.75	31 58.22	10 16 49.7	14 45.0	8.5314	9.2957		3.14
23	0	24.7	235	10 32 25.71	32 47.22	10 12 4.9	9 59.7	8.5316	9.2966		3.11
24	0	21.6	236	10 33 14.69	33 36.24	10 7 19.5	5 13.9	8.5317	9.2974		3.08
25	0	18.5	237	10 34 3.68	34 25.27	10 2 33.6	0 27.6	8.5318	9.2982		3.05
26	0	15.4	238	10 34 52.68	35 14.30	9 57 47.2	55 40.8	8.5319	9.2990		3.02
27	0	12.2	239	10 35 41.69	36 3.34	9 53 0.4	50 53.6	8.5319	9.2997		2.98
28	0	9.1	240	10 36 30.70	36 52.37	9 48 13.1	46 5.9	8.5318	9.3003		2.94
29	0	6.0	241	10 37 19.70	37 41.40	9 43 25.4	41 17.8	8.5318	9.3009		2.89
30	0	2.9	242	10 38 8.70	38 30.49	9 38 37.3	36 29.4	8.5318	9.3015		2.83
30 23	59.7		243	10 38 57.69	39 19.42	9 33 48.9	31 40.7	8.5316	9.3020	-1.68	2.76
31	23 56.6		244	10 39 46.65	40 8.41	+ 9 29 0.1	26 51.7	+8.5314	-9.3024	-1.74	-2.68

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t ² .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
Sept. 1 23 53.5	245	10 40 36.60	40 57.38	+ 9 24 11.1	22 2.5	+8.5312	-9.3027	-1.80			
2 23 50.4	246	10 41 24.53	41 46.32	9 19 21.9	17 13.0	8.5309	9.3030	1.86			
3 23 47.2	247	10 42 13.42	42 35.23	9 14 32.5	12 23.4	8.5307	9.3033	1.92			
4 23 44.1	248	10 43 2.28	43 24.10	9 9 42.9	7 33.6	8.5304	9.3035	1.98			
5 23 41.0	249	10 43 51.10	44 12.92	9 4 53.2	2 43.7	8.5300	9.3037	2.03			
6 23 37.9	250	10 44 39.87	45 1.69	9 0 3.4	57 53.7	8.5295	9.3037	2.08			
7 23 34.7	251	10 45 28.59	45 50.42	8 55 13.6	53 3.6	8.5290	9.3038	2.12			
8 23 31.6	252	10 46 17.25	46 39.08	8 50 23.7	48 13.6	8.5285	9.3039	2.16			
9 23 28.5	253	10 47 5.85	47 27.68	8 45 33.8	43 23.6	8.5280	9.3039	2.20			
10 23 25.4	254	10 47 54.39	48 16.21	8 40 44.0	38 33.7	8.5274	9.3037	2.23			
11 23 22.2	255	10 48 42.86	49 4.68	8 35 54.3	33 43.8	8.5267	9.3035	2.26			
12 23 19.1	256	10 49 31.25	49 53.07	8 31 4.7	28 54.1	8.5261	9.3033	2.28			
13 23 16.0	257	10 50 19.57	50 41.38	8 26 15.3	24 4.6	8.5253	9.3031	2.30	+2.68		
14 23 12.9	258	10 51 7.81	51 29.61	8 21 26.1	19 15.2	8.5246	9.3029	2.32	2.73		
15 23 9.7	259	10 51 55.97	52 17.76	8 16 37.0	14 26.0	8.5239	9.3026	2.34	2.78		
16 23 6.6	260	10 52 44.04	53 5.81	8 11 48.1	9 37.1	8.5230	9.3022	2.36	2.82		
17 23 3.5	261	10 53 32.01	53 53.76	8 6 59.5	4 48.5	8.5222	9.3017	2.38	2.86		
18 23 0.4	262	10 54 19.88	54 41.62	8 2 11.2	0 0.2	8.5213	-9.3012	2.40	2.89		
19 22 57.2	263	10 55 7.66	55 29.38	7 57 23.2	55 12.2	8.5203	9.3007	2.41	2.92		
20 22 54.1	264	10 55 55.33	56 17.03	7 52 35.5	50 24.6	8.5193	9.3001	2.42	2.95		
21 22 51.0	265	10 56 42.89	57 4.57	7 47 48.3	45 37.4	8.5183	9.2995	2.44	2.98		
22 22 47.9	266	10 57 30.34	57 51.99	7 43 1.5	40 50.6	8.5174	9.2990	2.45	3.02		
23 22 44.7	267	10 58 17.68	58 39.30	7 38 15.1	36 4.3	8.5163	9.2983	2.47	3.05		
24 22 41.6	268	10 59 4.90	59 26.49	7 33 29.2	31 18.4	8.5151	9.2975	2.49	3.08		
25 22 38.4	269	10 59 51.99	0 13.54	7 28 43.8	26 33.1	8.5139	9.2967	2.50	3.11		
26 22 35.3	270	11 0 39.95	1 0.46	7 23 58.9	21 48.4	8.5128	9.2959	2.52	3.14		
27 22 32.2	271	11 1 25.78	1 47.26	7 19 14.6	17 4.2	8.5115	9.2949	2.53	3.17		
28 22 29.0	272	11 2 12.47	2 33.92	7 14 31.0	12 20.7	8.5102	9.2938	2.55	3.20		
29 22 25.9	273	11 2 59.02	3 20.42	7 9 48.1	7 37.9	8.5088	9.2927	2.56	3.23		
30 22 22.7	274	11 3 45.42	4 6.78	7 5 5.9	2 55.9	8.5074	9.2917	2.58	3.26		
Oct. 1 22 19.6	275	11 4 31.67	4 52.99	7 0 24.4	58 14.6	8.5060	9.2905	2.59	3.28		
2 22 16.4	276	11 5 17.77	5 39.03	6 55 43.7	53 34.1	8.5045	9.2894	2.61	3.30		
3 22 13.2	277	11 6 3.70	6 24.90	6 51 3.8	48 54.6	8.5030	9.2880	2.63	3.32		
4 22 10.0	278	11 6 49.46	7 10.59	6 46 24.8	44 16.0	8.5013	9.2865	2.64	3.34		
5 22 6.9	279	11 7 35.03	7 56.10	6 41 46.8	39 38.3	8.4995	9.2849	2.65	3.36		
6 22 3.7	280	11 8 20.42	8 41.44	6 37 9.8	35 1.5	8.4977	9.2833	2.66	3.38		
7 22 0.5	281	11 9 5.63	9 26.58	6 32 33.8	30 25.8	8.4959	9.2817	2.67	3.40		
8 21 57.3	282	11 9 50.65	10 11.52	6 27 58.8	25 51.2	8.4940	9.2801	2.68	3.42		
9 21 54.2	283	11 10 35.47	10 56.28	6 23 24.9	21 17.6	8.4921	9.2784	2.69	3.44		
10 21 51.0	284	11 11 20.09	11 40.82	6 18 52.1	16 45.2	8.4901	9.2767	2.70	3.46		
11 21 47.8	285	11 12 4.50	12 25.16	6 14 20.4	12 13.9	8.4880	9.2749	2.71	3.48		
12 21 44.6	286	11 12 48.70	13 9.28	6 9 49.9	7 43.9	8.4859	9.2729	2.72	3.49		
13 21 41.4	287	11 13 32.69	13 53.19	6 5 20.7	3 15.1	8.4838	9.2708	2.72	3.50		
14 21 38.2	288	11 14 16.45	14 36.87	6 0 52.7	58 47.6	8.4816	9.2687	2.73	3.52		
15 21 35.0	289	11 14 59.99	15 20.33	5 56 26.1	54 21.5	8.4793	9.2665	2.74	3.53		
16 21 31.8	290	11 15 43.30	16 3.56	5 52 0.8	49 56.7	8.4771	9.2642	2.75	3.54		
17 21 28.6	291	11 16 26.38	16 46.55	5 47 36.9	45 33.3	8.4747	9.2619	2.76	3.55		
18 21 25.4	292	11 17 9.22	17 29.30	5 43 14.4	41 11.3	8.4723	9.2596	2.77	3.56		
19 21 22.2	293	11 17 51.82	18 11.90	5 38 53.3	36 50.8	8.4697	9.2572	2.78	3.57		
20 21 18.9	294	11 18 34.16	18 54.05	5 34 33.7	32 31.8	8.4671	9.2546	2.79	3.58		
21 21 15.7	295	11 19 16.25	19 36.05	5 30 15.7	28 14.4	8.4645	9.2519	2.80	3.59		
22 21 12.5	296	11 19 58.09	20 17.77	5 25 59.3	23 58.6	8.4618	9.2492	2.81	3.60		
23 21 9.2	297	11 20 39.67	20 59.24	5 21 44.4	19 44.4	8.4591	9.2465	2.82	3.61		
24 21 5.9	298	11 21 20.98	21 40.44	5 17 31.2	15 31.9	8.4562	9.2437	2.83	3.62		
25 21 2.7	299	11 22 2.01	22 21.36	5 13 19.7	11 21.1	8.4533	9.2408	2.84	3.63		
26 20 59.4	300	11 22 42.76	23 1.99	5 9 10.0	7 12.1	8.4503	9.2378	2.85	3.64		
27 20 56.1	301	11 23 23.23	23 42.33	5 5 2.0	3 4.9	8.4472	9.2345	2.86	3.65		
28 20 52.8	302	11 24 3.40	24 22.39	5 0 55.9	58 59.6	8.4440	9.2311	2.87	3.66		
29 20 49.6	303	11 24 43.28	25 2.13	4 56 51.7	54 56.2	8.4407	9.2276	2.88	3.67		
30 20 46.3	304	11 25 12.85	25 41.57	4 52 49.4	50 54.8	8.4373	9.2240	2.89	3.68		
31 20 43.0	305	11 26 2.11	26 20.70	4 48 49.2	46 55.4	8.4338	9.2204	2.90	3.69		
32 20 39.7	306	11 26 41.05	26 59.50	+ 4 44 51.0	42 58.0	+8.4302	-9.2168	-2.91	+3.70		

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 20 39.7	306	11 26 41.05	26 59.50	+ 4 44 51.0	42 58.0	+8.4302	-0.2168	-2.91	+3.70
2 20 36.4	307	11 27 19.67	27 37.96	4 40 54.8	39 2.8	8.4265	9.2130	2.91	3.72
3 20 33.1	308	11 27 57.95	28 16.12	4 37 0.8	35 9.7	8.4226	9.2090	2.92	3.73
4 20 29.8	309	11 28 35.89	28 53.91	4 33 8.9	31 18.7	8.4187	9.2049	2.93	3.74
5 20 26.5	310	11 29 13.49	29 31.36	4 29 19.2	27 30.0	8.4148	9.2006	2.94	3.75
6 20 23.2	311	11 29 50.74	30 8.45	4 25 31.8	23 43.6	8.4107	9.1962	2.95	3.76
7 20 19.9	312	11 30 27.63	30 45.18	4 21 46.7	19 59.6	8.4063	9.1916	2.95	3.76
8 20 16.6	313	11 31 4.15	31 21.54	4 18 4.0	16 18.0	8.4019	9.1870	2.96	3.77
9 20 13.2	314	11 31 40.30	31 57.54	4 14 23.7	12 38.8	8.3974	9.1823	2.96	3.78
10 20 9.9	315	11 32 16.08	32 33.16	4 10 45.8	9 2.0	8.3929	9.1774	2.97	3.78
11 20 6.5	316	11 32 51.49	33 8.40	4 7 10.4	5 27.7	8.3883	9.1723	2.97	3.79
12 20 3.2	317	11 33 26.52	33 43.25	4 3 37.5	1 55.9	8.3836	9.1673	2.98	3.80
13 19 59.8	318	11 34 1.16	34 17.71	4 0 7.1	58 26.7	8.3787	9.1620	2.98	3.81
14 19 56.5	319	11 34 35.40	34 51.76	3 56 39.3	55 0.1	8.3735	9.1564	2.99	3.82
15 19 53.1	320	11 35 9.23	35 25.41	3 53 14.2	51 36.2	8.3683	9.1508	2.99	3.83
16 19 49.7	321	11 35 42.65	35 58.66	3 49 51.8	48 15.0	8.3630	9.1446	3.00	3.83
17 19 46.3	322	11 36 15.67	36 31.49	3 46 32.2	44 56.6	8.3576	9.1382	3.00	3.84
18 19 42.9	323	11 36 48.37	37 3.90	3 43 15.3	41 41.0	8.3519	9.1326	3.01	3.84
19 19 39.5	324	11 37 20.44	37 35.88	3 40 1.2	36 28.2	8.3462	9.1262	3.01	3.85
20 19 36.1	325	11 37 52.18	38 7.42	3 36 50.0	35 18.3	8.3402	9.1197	3.02	3.86
21 19 32.6	326	11 38 23.48	38 38.52	3 33 41.6	32 11.3	8.3341	9.1131	3.03	3.87
22 19 29.2	327	11 38 54.34	39 9.17	3 30 36.1	29 7.2	8.3279	9.1061	3.03	3.88
23 19 25.8	328	11 39 24.75	39 39.37	3 27 33.7	26 6.2	8.3213	9.0990	3.04	3.89
24 19 22.4	329	11 39 54.70	40 9.10	3 24 34.3	23 8.3	8.3146	9.0914	3.05	3.89
25 19 18.9	330	11 40 24.18	40 38.36	3 21 38.1	20 13.5	8.3077	9.0838	3.05	3.90
26 19 15.5	331	11 40 53.19	41 7.15	3 18 45.0	17 21.9	8.3006	9.0759	3.06	3.90
27 19 12.0	332	11 41 21.72	41 35.45	3 15 55.1	14 33.6	8.2933	9.0675	3.06	3.91
28 19 8.6	333	11 41 49.77	42 3.26	3 13 8.5	11 48.5	8.2857	9.0590	3.07	3.91
29 19 5.1	334	11 42 17.32	42 30.57	3 10 26.2	9 6.8	8.2778	9.0502	3.08	3.91
30 19 1.6	335	11 42 44.36	42 57.38	3 7 45.3	6 28.4	8.2697	9.0411	3.09	3.92
Dec. 1 18 58.1	336	11 43 10.90	43 23.67	3 5 8.7	3 53.4	8.2612	9.0319	3.10	3.92
2 18 54.6	337	11 43 36.92	43 49.44	3 2 35.5	1 21.8	8.2524	9.0215	3.11	3.93
3 18 51.1	338	11 44 2.41	44 14.68	3 0 5.9	58 53.7	8.2433	9.0114	3.11	3.93
4 18 47.6	339	11 44 27.37	44 39.40	2 57 39.8	56 29.2	8.2341	9.0013	3.12	3.94
5 18 44.1	340	11 44 51.80	45 3.58	2 55 17.2	54 8.4	8.2247	8.9908	3.12	3.94
6 18 40.6	341	11 45 15.69	45 27.21	2 52 58.3	51 51.3	8.2149	8.9796	3.13	3.95
7 18 37.0	342	11 45 39.03	45 50.22	2 50 43.0	49 37.9	8.2046	8.9674	3.13	3.95
8 18 33.4	343	11 46 1.81	46 12.79	2 48 31.3	47 28.1	8.1940	8.9550	3.14	3.96
9 18 29.9	344	11 46 24.04	46 34.74	2 46 23.4	45 22.0	8.1828	8.9422	3.14	3.96
10 18 26.3	345	11 46 45.79	46 56.12	2 44 19.3	43 19.7	8.1713	8.9290	3.15	3.96
11 18 22.7	346	11 47 6.79	47 16.93	2 42 18.9	41 21.2	8.1596	8.9156	3.15	3.97
12 18 19.1	347	11 47 27.30	47 37.17	2 40 22.3	39 26.5	8.1477	8.9011	3.15	3.97
13 18 15.5	348	11 47 47.24	47 56.83	2 38 29.6	37 35.7	8.1350	8.8854	3.16	3.97
14 18 11.9	349	11 48 6.59	48 15.90	2 36 40.9	35 48.9	8.1216	8.8700	3.16	3.98
15 18 8.3	350	11 48 25.34	48 34.36	2 34 56.1	34 6.0	8.1078	8.8539	3.16	3.98
16 18 4.6	351	11 48 43.50	48 52.23	2 33 15.2	32 27.0	8.0932	8.8366	3.17	3.98
17 18 1.0	352	11 49 1.05	49 9.49	2 31 38.3	30 52.1	8.0783	8.8184	3.17	3.99
18 17 57.4	353	11 49 18.00	49 26.14	2 30 5.5	29 21.3	8.0630	8.7999	3.18	3.99
19 17 53.7	354	11 49 34.34	49 42.17	2 28 36.7	27 54.5	8.0468	8.7801	3.18	3.99
20 17 50.0	355	11 49 50.05	49 57.57	2 27 12.0	26 31.9	8.0291	8.7589	3.18	4.00
21 17 46.3	356	11 50 5.14	50 12.35	2 25 51.5	25 13.5	8.0116	8.7354	3.19	4.00
22 17 42.6	357	11 50 19.61	50 26.50	2 24 35.3	23 59.2	7.9923	8.7114	3.19	4.00
23 17 38.9	358	11 50 33.44	50 40.02	2 23 23.3	22 49.2	7.9722	8.6864	3.19	4.01
24 17 35.2	359	11 50 46.62	50 52.88	2 22 15.5	21 43.6	7.9507	8.6592	3.20	4.01
25 17 31.5	360	11 50 59.14	51 5.08	2 21 12.0	20 42.2	7.9272	8.6272	3.20	4.02
26 17 27.8	361	11 51 10.99	51 16.61	2 20 12.9	19 45.3	7.9031	8.5945	3.20	4.02
27 17 24.0	362	11 51 22.18	51 27.48	2 19 18.1	18 52.7	7.8775	8.5606	3.21	4.02
28 17 20.2	363	11 51 32.71	51 37.69	2 18 27.7	18 4.5	7.8504	8.5250	3.21	4.02
29 17 16.4	364	11 51 42.58	51 47.22	2 17 41.7	17 20.8	7.8211	8.4821	3.21	4.03
30 17 12.6	365	11 51 51.78	51 56.08	2 17 0.2	16 41.6	7.7890	8.4365	3.21	4.03
31 17 8.8	366	11 52 0.30	52 4.26	2 16 23.1	16 6.9	7.7547	8.3838	3.22	4.03
32 17 5.0	367	11 52 8.14	52 11.76	+ 2 15 50.5	15 36.7	+7.7164	-8.3237	-3.22	+4.03

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
Jan. 0 16 2.5	0	10 46 35.84	46 33.76	+ 9 40' 48.3	41' 8.0	-7.5001	+8.480	-2.99	+3.75		
1 15 58.5	1	10 46 31.08	46 28.82	9 41 32.9	41 53.7	7.5371	8.503	2.99	3.75		
2 15 54.5	2	10 46 25.92	46 23.48	9 42 19.9	42 41.8	7.5708	8.524	2.99	3.75		
3 15 50.5	3	10 46 20.36	46 17.74	9 43 9.2	43 32.1	7.6017	8.544	2.98	3.75		
4 15 46.4	4	10 46 14.41	46 11.61	9 44 0.8	44 24.7	7.6302	8.564	2.97	3.74		
5 15 42.4	5	10 46 8.07	46 5.09	9 44 54.7	45 19.6	7.6572	8.582	2.97	3.74		
6 15 38.3	6	10 46 1.33	45 58.18	9 45 50.9	46 16.8	7.6827	8.600	2.96	3.73		
7 15 34.3	7	10 45 54.20	45 50.88	9 46 49.3	47 16.2	7.7064	8.616	2.96	3.72		
8 15 30.2	8	10 45 46.68	45 43.19	9 47 49.9	48 17.8	7.7284	8.632	2.96	3.71		
9 15 26.1	9	10 45 38.79	45 35.13	9 48 52.7	49 21.5	7.7488	8.647	2.95	3.70		
10 15 22.1	10	10 45 30.53	45 26.70	9 49 57.6	50 27.3	7.7685	8.661	2.95	3.70		
11 15 18.0	11	10 45 21.89	45 17.90	9 51 4.6	51 35.2	7.7874	8.674	2.94	3.69		
12 15 13.9	12	10 45 12.88	45 8.73	9 52 13.6	52 45.2	7.8060	8.687	2.93	3.68		
13 15 9.8	13	10 45 3.51	44 59.20	9 53 24.7	53 57.2	7.8217	8.700	2.93	3.67		
14 15 5.7	14	10 44 53.78	44 49.31	9 54 37.8	55 11.1	7.8377	8.711	2.92	3.66		
15 15 1.6	15	10 44 43.69	44 39.07	9 55 52.8	56 26.9	7.8528	8.722	2.92	3.65		
16 14 57.5	16	10 44 33.26	44 28.48	9 57 9.7	57 44.6	7.8670	8.733	2.91	3.64		
17 14 53.4	17	10 44 22.49	44 17.56	9 58 28.5	59 4.2	7.8805	8.743	2.90	3.63		
18 14 49.3	18	10 44 11.39	44 6.31	9 59 49.2	60 25.7	7.8934	8.753	2.90	3.62		
19 14 45.2	19	10 43 59.96	43 54.74	10 1 11.6	1 48.9	7.9059	8.762	2.89	3.61		
20 14 41.1	20	10 43 48.20	43 42.85	10 2 35.7	3 13.7	7.9177	8.771	2.88	3.60		
21 14 37.0	21	10 43 36.13	43 30.64	10 4 1.5	4 40.2	7.9289	8.779	2.88	3.58		
22 14 32.8	22	10 43 23.75	43 18.12	10 5 29.0	6 8.4	7.9396	8.788	2.87	3.57		
23 14 28.7	23	10 43 11.07	43 5.31	10 6 58.1	7 38.2	7.9497	8.795	2.86	3.56		
24 14 24.5	24	10 42 58.10	42 52.21	10 8 28.7	9 9.5	7.9594	8.802	2.85	3.54		
25 14 20.4	25	10 42 44.84	42 38.83	10 10 0.8	10 42.2	7.9689	8.809	2.84	3.53		
26 14 16.2	26	10 42 31.29	42 25.16	10 11 34.3	12 16.3	7.9781	8.816	2.83	3.51		
27 14 12.1	27	10 42 17.46	42 11.21	10 13 9.2	13 51.8	7.9867	8.822	2.81	3.50		
28 14 7.9	28	10 42 3.36	41 56.99	10 14 45.5	15 28.7	7.9949	8.828	2.80	3.48		
29 14 3.7	29	10 41 49.00	41 42.51	10 16 23.1	17 6.9	8.0027	8.834	2.78	3.46		
30 13 59.6	30	10 41 34.38	41 27.78	10 18 2.0	18 46.3	8.0103	8.839	2.77	3.44		
31 13 55.4	31	10 41 19.51	41 12.81	10 19 42.1	20 26.9	8.0173	8.845	2.75	3.42		
Feb. 1 13 51.2	32	10 41 4.41	40 57.61	10 21 23.4	22 8.7	8.0239	8.850	2.73	3.40		
2 13 47.0	33	10 40 49.08	40 42.18	10 23 5.8	23 51.6	8.0303	8.854	2.72	3.38		
3 13 42.8	34	10 40 33.53	40 26.54	10 24 49.3	25 35.6	8.0364	8.859	2.70	3.35		
4 13 38.6	35	10 40 17.76	40 10.68	10 26 33.8	27 20.5	8.0424	8.863	2.68	3.33		
5 13 34.4	36	10 40 1.78	39 54.61	10 28 19.2	29 6.3	8.0479	8.866	2.66	3.30		
6 13 30.2	37	10 39 45.60	39 38.35	10 30 5.5	30 53.0	8.0530	8.870	2.64	3.27		
7 13 26.0	38	10 39 29.24	39 21.91	10 31 52.6	32 40.4	8.0576	8.873	2.62	3.24		
8 13 21.8	39	10 39 12.70	39 5.29	10 33 40.4	34 28.5	8.0625	8.876	2.60	3.21		
9 13 17.6	40	10 38 55.98	38 48.51	10 35 28.9	36 17.3	8.0670	8.878	2.57	3.17		
10 13 13.4	41	10 38 39.10	38 31.57	10 37 18.1	38 6.7	8.0708	8.881	2.54	3.11		
11 13 9.2	42	10 38 22.08	38 14.49	10 39 7.8	39 56.6	8.0744	8.883	2.51	3.04		
12 13 5.0	43	10 38 4.92	37 57.27	10 40 58.0	41 47.0	8.0778	8.885	2.48	2.96		
13 13 0.7	44	10 37 47.63	37 39.92	10 42 48.6	43 37.7	8.0811	8.886	2.44	2.87		
14 12 56.5	45	10 37 30.21	37 22.46	10 44 39.6	45 28.8	8.0839	8.887	2.40	2.78		
15 12 52.3	46	10 37 12.69	37 4.90	10 46 30.9	47 20.2	8.0864	8.888	2.36	+2.68		
16 12 48.1	47	10 36 55.07	36 47.24	10 48 22.4	49 11.8	8.0888	8.889	2.31			
17 12 43.9	48	10 36 37.36	36 29.50	10 50 14.1	51 3.5	8.0907	8.890	2.26			
18 12 39.6	49	10 36 19.58	36 11.69	10 52 5.9	52 55.3	8.0924	8.890	2.20			
19 12 35.4	50	10 36 1.73	35 53.82	10 53 57.8	54 47.2	8.0941	8.890	2.12			
20 12 31.2	51	10 35 43.81	35 35.89	10 55 49.7	56 39.1	8.0955	8.890	2.01			
21 12 26.9	52	10 35 25.85	35 17.92	10 57 41.5	58 30.8	8.0964	8.890	1.87	-2.68		
22 12 22.7	53	10 35 7.85	34 59.91	10 59 33.1	60 22.3	8.0973	8.889	-1.68	2.78		
23 12 18.4	54	10 34 49.82	34 41.87	11 1 24.6	2 13.7	8.0979	8.888		2.86		
24 12 14.2	55	10 34 31.77	34 23.82	11 3 15.9	4 4.9	8.0982	8.888		2.93		
25 12 10.0	56	10 34 13.71	34 5.76	11 5 6.9	5 55.7	8.0984	8.886		2.99		
26 12 5.7	57	10 33 55.65	33 47.71	11 6 57.5	7 46.1	8.0982	8.885	+1.68	3.05		
27 12 1.5	58	10 33 37.60	33 29.67	11 8 47.7	9 36.1	8.0979	8.883	1.86	3.11		
28 11 57.2	59	10 33 19.57	33 11.65	11 10 37.5	11 25.6	8.0973	8.881	1.98	3.16		
29 11 53.0	60	10 33 1.57	32 53.67	11 12 26.8	13 14.6	8.0964	8.879	2.08	3.20		
30 11 48.7	61	10 32 43.61	32 35.73	+11 14 15.4	15 3.0	-8.0955	+8.876	+2.16	-3.24		

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. d h m	d	h m s	m s	° ' "	' "				
1 11 53.0	60	10 33 1.57	32 53.67	+11 12 26.8	13 14.6	-8.0964	+8.879	+2.08	-3.20
2 11 48.7	61	10 32 43.61	32 35.73	11 14 15.4	15 3.0	8.0955	8.876	2.16	3.24
3 11 44.5	62	10 32 25.69	32 17.84	11 16 3.4	16 50.7	8.0943	8.874	2.22	3.27
4 11 40.3	63	10 32 7.83	32 0.02	11 17 50.7	18 37.6	8.0926	8.871	2.28	3.30
5 11 36.1	64	10 31 50.05	31 42.27	11 19 37.2	20 23.7	8.0906	8.867	2.33	3.33
6 11 31.9	65	10 31 32.35	31 24.61	11 21 22.8	22 8.9	8.0886	8.864	2.38	3.36
7 11 27.7	66	10 31 14.73	31 7.04	11 23 7.6	23 53.3	8.0864	8.860	2.42	3.39
8 11 23.4	67	10 30 57.21	30 49.57	11 24 51.5	25 36.8	8.0837	8.856	2.46	3.42
9 11 19.2	68	10 30 39.81	30 32.22	11 26 34.4	27 19.2	8.0807	8.852	2.50	3.44
10 11 15.0	69	10 30 22.53	30 14.99	11 28 16.3	29 0.6	8.0777	8.848	2.53	3.46
11 11 10.8	70	10 30 5.37	29 57.90	11 29 57.2	30 41.0	8.0744	8.843	2.56	3.48
12 11 6.5	71	10 29 48.35	29 40.95	11 31 36.9	32 20.2	8.0707	8.837	2.59	3.49
13 11 2.3	72	10 29 31.48	29 24.15	11 33 15.3	33 58.0	8.0667	8.832	2.61	3.50
14 10 58.1	73	10 29 14.77	29 7.52	11 34 52.4	35 34.5	8.0623	8.826	2.63	3.51
15 10 53.9	74	10 28 58.24	28 51.07	11 36 28.2	37 9.7	8.0577	8.820	2.65	3.53
16 10 49.7	75	10 28 41.88	28 34.79	11 38 2.6	38 43.5	8.0530	8.813	2.67	3.54
17 10 45.5	76	10 28 25.70	28 18.70	11 39 35.6	40 15.9	8.0479	8.807	2.68	3.56
18 10 41.3	77	10 28 9.72	28 2.81	11 41 7.2	41 46.8	8.0424	8.800	2.70	3.57
19 10 37.1	78	10 27 53.95	27 47.13	11 42 37.3	43 16.2	8.0364	8.793	2.72	3.58
20 10 32.9	79	10 27 38.40	27 31.67	11 44 5.9	44 44.1	8.0304	8.785	2.73	3.59
21 10 28.7	80	10 27 23.06	27 16.44	11 45 33.0	46 10.5	8.0242	8.777	2.75	3.60
22 10 24.5	81	10 27 7.95	27 1.44	11 46 58.4	47 35.2	8.0176	8.769	2.76	3.61
23 10 20.3	82	10 26 53.07	26 46.67	11 48 22.1	48 58.2	8.0107	8.760	2.77	3.62
24 10 16.1	83	10 26 38.43	26 32.14	11 49 44.1	50 19.5	8.0035	8.751	2.79	3.63
25 10 12.0	84	10 26 24.04	26 17.86	11 51 4.5	51 39.1	7.9959	8.742	2.80	3.64
26 10 7.8	85	10 26 9.90	26 3.84	11 52 23.2	52 56.9	7.9879	8.732	2.81	3.65
27 10 3.6	86	10 25 56.03	25 50.09	11 53 40.0	54 12.9	7.9795	8.722	2.83	3.65
28 9 59.5	87	10 25 42.43	25 36.61	11 54 55.0	55 27.1	7.9708	8.711	2.84	3.66
29 9 55.3	88	10 25 29.10	25 23.40	11 56 8.1	56 39.4	7.9619	8.700	2.85	3.66
30 9 51.2	89	10 25 16.05	25 10.48	11 57 19.4	57 49.8	7.9524	8.689	2.86	3.67
31 9 47.1	90	10 25 3.20	24 57.85	11 58 28.8	58 58.3	7.9424	8.677	2.87	3.67
Apr. 1 9 42.9	91	10 24 50.83	24 45.52	11 59 36.2	60 4.8	7.9319	8.664	2.88	3.68
2 9 38.8	92	10 24 38.67	24 33.50	12 0 41.6	1 9.4	7.9210	8.650	2.89	3.69
3 9 34.7	93	10 24 26.82	24 21.79	12 1 45.1	2 12.0	7.9095	8.637	2.90	3.69
4 9 30.6	94	10 24 15.29	24 10.40	12 2 46.6	3 12.6	7.8976	8.623	2.90	3.70
5 9 26.5	95	10 24 4.07	23 59.33	12 3 46.0	4 11.1	7.8852	8.608	2.91	3.70
6 9 22.4	96	10 23 53.18	23 48.58	12 4 43.4	5 7.5	7.8718	8.592	2.92	3.70
7 9 18.3	97	10 23 42.63	23 38.17	12 5 38.6	6 1.8	7.8580	8.575	2.93	3.71
8 9 14.2	98	10 23 32.41	23 28.10	12 6 31.7	6 54.0	7.8440	8.558	2.93	3.71
9 9 10.1	99	10 23 22.52	23 18.36	12 7 22.6	7 44.0	7.8291	8.539	2.94	3.72
10 9 6.0	100	10 23 12.98	23 8.97	12 8 11.4	8 31.8	7.8129	8.520	2.94	3.72
11 9 1.9	101	10 23 3.90	22 59.94	12 8 58.0	9 17.4	7.7959	8.500	2.94	3.72
12 8 57.8	102	10 22 54.98	22 51.28	12 9 42.4	10 0.8	7.7781	8.478	2.94	3.73
13 8 53.7	103	10 22 46.52	22 42.98	12 10 24.5	10 42.0	7.7597	8.454	2.95	3.73
14 8 49.7	104	10 22 38.42	22 35.04	12 11 4.4	11 20.9	7.7404	8.430	2.95	3.73
15 8 45.6	105	10 22 30.68	22 27.46	12 11 42.0	11 57.6	7.7199	8.404	2.95	3.73
16 8 41.6	106	10 22 23.31	22 20.25	12 12 17.4	12 32.0	7.6978	8.376	2.95	3.73
17 8 37.6	107	10 22 16.32	22 13.42	12 12 50.5	13 4.1	7.6741	8.346	2.95	3.74
18 8 33.5	108	10 22 9.71	22 6.97	12 13 21.3	13 33.9	7.6492	8.314	2.96	3.74
19 8 29.5	109	10 22 3.48	22 0.91	12 13 49.8	14 1.4	7.6227	8.279	2.96	3.74
20 8 25.5	110	10 21 57.63	21 55.22	12 14 16.0	14 26.6	7.5945	8.240	2.96	3.74
21 8 21.4	111	10 21 52.16	21 49.92	12 14 39.9	14 49.6	7.5639	8.200	2.96	3.74
22 8 17.4	112	10 21 47.08	21 45.00	12 15 1.6	15 10.3	7.5309	8.154	2.96	3.74
23 8 13.4	113	10 21 42.38	21 40.47	12 15 21.0	15 28.7	7.4953	8.103	2.97	3.74
24 8 9.4	114	10 21 38.07	21 36.33	12 15 38.1	15 44.8	7.4560	8.044	2.97	3.74
25 8 5.4	115	10 21 34.15	21 32.58	12 15 52.9	15 58.6	7.4128	7.975	2.97	3.74
26 8 1.4	116	10 21 30.62	21 29.22	12 16 5.3	16 10.0	7.3641	7.893	2.97	3.74
27 7 57.4	117	10 21 27.49	21 26.26	12 16 15.4	16 19.1	7.3092	7.793	2.97	3.74
28 7 53.5	118	10 21 24.75	21 23.69	12 16 23.2	16 25.9	7.2473	7.664	2.98	3.74
29 7 49.5	119	10 21 22.40	21 21.51	12 16 28.7	16 30.4	7.1741	7.475	2.98	3.74
30 7 45.5	120	10 21 20.45	21 19.73	12 16 31.8	16 32.6	7.0859	+7.132	2.98	3.74
31 7 41.6	121	10 21 18.89	21 18.35	+12 16 32.6	16 32.4	-6.9752	-6.319	+2.98	-3.74

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .		In R.A.	In Dec.
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.				
May	d h m	d h m s	m s	+12 16 32.6	16 32.4	-6.9752	-6.319	+2.98	-3.74		
1	7 41.6	121	10 21 18.89	21 18.35	12 16 31.2	16 29.9	6.8239	7.257	2.98	3.74	
2	7 37.6	122	10 21 17.73	21 17.36	12 16 27.4	16 25.1	6.5898	7.536	2.99	3.74	
3	7 33.7	123	10 21 16.97	21 16.77	12 16 21.3	16 18.0	-6.0458	7.702	2.99	3.74	
4	7 29.7	124	10 21 16.61	21 16.58	12 16 12.9	16 8.6	+6.2219	7.824	2.99	3.74	
5	7 25.8	125	10 21 16.65	21 16.79	12 16 2.1	15 56.8	6.6478	7.921	2.99	3.74	
6	7 21.9	126	10 21 17.09	21 17.40	12 15 48.9	15 42.6	6.8587	7.998	2.99	3.74	
7	7 18.0	127	10 21 17.93	21 18.42	12 15 33.4	15 26.1	7.0000	8.062	2.99	3.74	
8	7 14.1	128	10 21 19.17	21 19.83	12 15 15.7	15 7.4	7.1065	8.117	2.99	3.74	
9	7 10.2	129	10 21 20.81	21 21.64	12 14 55.7	14 46.4	7.1919	8.167	2.99	3.74	
10	7 6.3	130	10 21 22.85	21 23.85	12 14 33.4	14 23.1	7.2632	8.212	2.99	3.74	
11	7 2.4	131	10 21 25.29	21 26.46	12 14 8.8	13 57.5	7.3245	8.252	2.99	3.73	
12	6 58.5	132	10 21 28.13	21 29.48	12 13 41.9	13 29.6	7.3782	8.290	2.99	3.73	
13	6 54.6	133	10 21 31.37	21 32.89	12 13 12.7	12 59.4	7.4260	8.324	2.98	3.73	
14	6 50.8	134	10 21 35.01	21 36.70	12 12 41.2	12 26.9	7.4680	8.356	2.98	3.73	
15	6 46.9	135	10 21 39.05	21 40.91	12 12 7.4	11 52.2	7.5058	8.384	2.98	3.73	
16	6 43.1	136	10 21 43.47	21 45.51	12 11 31.4	11 15.3	7.5411	8.410	2.98	3.72	
17	6 39.3	137	10 21 48.28	21 50.49	12 10 53.3	10 36.2	7.5736	8.435	2.97	3.72	
18	6 35.4	138	10 21 53.48	21 55.85	12 10 13.0	9 55.0	7.6039	8.459	2.97	3.72	
19	6 31.6	139	10 21 59.07	22 1.60	12 9 30.5	9 11.6	7.6319	8.481	2.97	3.72	
20	6 27.8	140	10 22 5.05	22 7.74	12 8 45.8	8 26.0	7.6579	8.502	2.96	3.71	
21	6 23.9	141	10 22 11.41	22 14.27	12 7 58.9	7 38.2	7.6824	8.522	2.96	3.71	
22	6 20.1	142	10 22 18.15	22 21.18	12 7 9.9	6 48.2	7.7056	8.541	2.96	3.71	
23	6 16.3	143	10 22 25.27	22 28.46	12 6 18.7	5 56.1	7.7273	8.560	2.95	3.70	
24	6 12.5	144	10 22 32.77	22 36.12	12 5 25.4	5 1.9	7.7477	8.577	2.95	3.70	
25	6 8.7	145	10 22 40.64	22 44.15	12 4 30.0	4 5.5	7.7672	8.593	2.95	3.70	
26	6 4.9	146	10 22 48.88	22 52.55	12 3 32.5	3 7.0	7.7859	8.609	2.95	3.69	
27	6 1.1	147	10 22 57.49	23 1.32	12 2 32.9	2 6.5	7.8038	8.624	2.94	3.69	
28	5 57.3	148	10 23 6.47	23 10.46	12 1 31.3	1 4.0	7.8207	8.638	2.94	3.69	
29	5 53.5	149	10 23 15.82	23 19.97	11 60 27.6	59 59.4	7.8368	8.653	2.94	3.69	
30	5 49.7	150	10 23 26.53	23 29.84	11 59 21.8	58 52.7	7.8524	8.666	2.94	3.68	
31	5 45.9	151	10 23 35.60	23 40.06	11 58 14.0	57 44.0	7.8672	8.679	2.93	3.68	
June	d h m	d h m s	m s	11 57 4.3	56 33.3	7.8813	8.691	2.93	3.68		
1	5 42.2	152	10 23 46.03	23 50.64	11 55 52.5	55 20.6	7.8949	8.704	2.93	3.68	
2	5 38.4	153	10 23 56.81	24 1.58	11 54 38.7	54 5.9	7.9083	8.716	2.93	3.67	
3	5 34.7	154	10 24 7.94	24 12.87	11 53 22.9	52 49.3	7.9214	8.727	2.92	3.67	
4	5 30.9	155	10 24 19.42	24 24.51	11 52 5.1	51 30.7	7.9337	8.738	2.92	3.67	
5	5 27.2	156	10 24 31.26	24 36.50	11 50 45.4	50 10.1	7.9454	8.748	2.92	3.66	
6	5 23.5	157	10 24 43.45	24 48.84	11 49 23.7	48 47.6	7.9568	8.759	2.91	3.66	
7	5 19.8	158	10 24 55.98	25 1.52	11 48 0.1	47 23.2	7.9678	8.768	2.91	3.66	
8	5 16.1	159	10 25 8.85	25 14.54	11 46 34.7	45 57.0	7.9785	8.778	2.91	3.65	
9	5 12.4	160	10 25 22.05	25 27.89	11 45 7.5	44 28.9	7.9889	8.787	2.90	3.65	
10	5 8.7	161	10 25 35.59	25 41.57	11 43 38.4	42 59.0	7.9986	8.796	2.90	3.64	
11	5 5.0	162	10 25 49.46	25 55.58	11 42 7.5	41 27.3	8.0081	8.805	2.89	3.64	
12	5 1.3	163	10 26 3.66	26 9.92	11 40 34.7	39 53.7	8.0173	8.813	2.89	3.63	
13	4 57.6	164	10 26 18.17	26 24.58	11 39 0.1	38 18.3	8.0263	8.822	2.88	3.63	
14	4 53.9	165	10 26 33.00	26 39.55	11 37 23.7	36 41.1	8.0352	8.829	2.88	3.62	
15	4 50.2	166	10 26 48.14	26 54.84	11 35 45.6	35 2.2	8.0436	8.837	2.87	3.62	
16	4 46.5	167	10 27 3.60	27 10.44	11 34 5.8	33 21.6	8.0517	8.845	2.86	3.61	
17	4 42.8	168	10 27 19.37	27 26.34	11 32 24.2	31 39.3	8.0597	8.852	2.86	3.61	
18	4 39.2	169	10 27 35.44	27 42.54	11 30 40.9	29 55.3	8.0673	8.859	2.85	3.60	
19	4 35.5	170	10 27 51.81	27 59.04	11 28 56.0	28 9.6	8.0748	8.866	2.85	3.60	
20	4 31.9	171	10 28 8.48	28 15.84	11 27 9.4	26 22.3	8.0819	8.873	2.84	3.59	
21	4 28.3	172	10 28 25.44	28 32.93	11 25 21.2	24 33.4	8.0890	8.879	2.83	3.59	
22	4 24.6	173	10 28 42.69	28 50.31	11 23 31.4	22 42.9	8.0959	8.885	2.83	3.58	
23	4 21.0	174	10 29 0.22	29 7.97	11 21 40.0	20 50.8	8.1025	8.892	2.82	3.58	
24	4 17.4	175	10 29 18.04	29 25.92	11 19 47.0	18 57.1	8.1090	8.898	2.82	3.57	
25	4 13.7	176	10 29 36.14	29 44.15	11 17 52.5	17 1.9	8.1153	8.903	2.81	3.57	
26	4 10.1	177	10 29 54.51	30 2.65	11 15 56.4	15 5.1	8.1213	8.909	2.80	3.56	
27	4 6.5	178	10 30 13.16	30 21.41	11 13 58.8	13 6.8	8.1272	8.915	2.80	3.56	
28	4 2.9	179	10 30 32.07	30 40.44	11 11 59.7	11 7.0	8.1330	8.920	2.79	3.55	
29	3 59.2	180	10 30 51.24	30 59.73	+11 9 59.1	9 5.7	+8.1387	-8.926	+2.78	-3.55	
30	3 55.6	181	10 31 10.67	31 19.28							
31	3 52.0	182	10 31 30.36	31 39.09							

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d	h	m	d	h	m	s	m	s	°	'
1	3	52.0	182	10 31 30.36	31 39.09	+11° 9' 50.1	9' 5.7	+8.1387	-8.926	+2.78	-3.55
2	3	48.4	183	10 31 50.31	31 59.15	11 7 57.0	7 3.0	8.1444	8.931	2.77	3.54
3	3	44.8	184	10 32 10.52	32 19.47	11 5 53.5	4 58.8	8.1498	8.936	2.76	3.53
4	3	41.2	185	10 32 30.97	32 40.03	11 3 48.5	2 53.2	8.1549	8.941	2.76	3.53
5	3	37.6	186	10 32 51.66	33 0.83	11 1 42.1	0 46.2	8.1599	8.946	2.75	3.52
6	3	34.0	187	10 33 12.59	33 21.97	10 59 34.4	58 37.8	8.1649	8.950	2.74	3.51
7	3	30.5	188	10 33 33.76	33 43.15	10 57 25.3	56 28.1	8.1697	8.955	2.73	3.50
8	3	26.9	189	10 33 55.16	34 4.66	10 55 14.8	54 17.0	8.1744	8.959	2.72	3.49
9	3	23.3	190	10 34 16.79	34 26.39	10 53 2.9	52 4.5	8.1789	8.964	2.72	3.49
10	3	19.8	191	10 34 38.64	34 48.34	10 50 49.7	49 50.7	8.1833	8.968	2.71	3.48
11	3	16.2	192	10 35 0.71	35 10.51	10 48 35.3	47 35.7	8.1876	8.973	2.70	3.47
12	3	12.7	193	10 35 23.00	35 32.90	10 46 19.7	45 19.5	8.1918	8.976	2.69	3.47
13	3	9.1	194	10 35 45.50	35 55.50	10 44 2.8	43 2.0	8.1958	8.980	2.68	3.46
14	3	5.6	195	10 36 8.21	36 18.31	10 41 44.7	40 43.3	8.1998	8.984	2.68	3.45
15	3	2.1	196	10 36 31.12	36 41.32	10 39 25.4	38 23.4	8.2036	8.987	2.67	3.45
16	2	58.5	197	10 36 54.23	37 4.52	10 37 4.9	36 2.3	8.2073	8.991	2.66	3.44
17	2	55.0	198	10 37 17.54	37 27.92	10 34 43.3	33 40.2	8.2109	8.994	2.65	3.43
18	2	51.4	199	10 37 41.04	37 51.51	10 32 20.6	31 17.0	8.2144	8.998	2.64	3.42
19	2	47.9	200	10 38 4.72	38 15.28	10 29 56.8	28 52.7	8.2177	9.001	2.64	3.42
20	2	44.4	201	10 38 28.58	38 39.23	10 27 31.9	26 27.3	8.2209	9.004	2.63	3.41
21	2	40.8	202	10 38 52.62	39 3.35	10 25 5.9	24 0.8	8.2242	9.007	2.62	3.40
22	2	37.3	203	10 39 16.84	39 27.65	10 22 38.9	21 33.3	8.2273	9.010	2.61	3.39
23	2	33.8	204	10 39 41.23	39 52.12	10 20 10.9	19 4.8	8.2303	9.013	2.60	3.38
24	2	30.2	205	10 40 4.78	40 16.75	10 17 41.8	16 35.2	8.2332	9.016	2.59	3.37
25	2	26.7	206	10 40 30.50	40 41.55	10 15 11.7	14 4.6	8.2361	9.019	2.58	3.36
26	2	23.2	207	10 40 55.38	41 6.51	10 12 40.7	11 33.1	8.2389	9.022	2.57	3.35
27	2	19.7	208	10 41 20.42	41 31.63	10 10 8.8	9 0.8	8.2416	9.024	2.56	3.34
28	2	16.2	209	10 41 45.61	41 56.89	10 7 36.1	6 27.6	8.2442	9.027	2.55	3.33
29	2	12.7	210	10 42 10.95	42 22.30	10 5 2.5	3 53.6	8.2467	9.029	2.54	3.32
30	2	9.2	211	10 42 36.44	42 47.86	10 2 28.0	1 18.7	8.2492	9.032	2.53	3.31
Aug.	1	5.7	212	10 43 2.07	43 13.56	9 59 52.6	58 42.9	8.2516	9.034	2.52	3.30
2	1	2.2	213	10 43 27.84	43 39.40	9 57 16.3	56 6.2	8.2539	9.037	2.51	3.29
3	1	58.7	214	10 43 53.75	44 5.38	9 54 39.1	53 28.6	8.2562	9.039	2.49	3.28
4	1	55.2	215	10 44 19.79	44 31.49	9 52 1.1	50 50.2	8.2584	9.041	2.48	3.27
5	1	51.7	216	10 44 45.96	44 57.72	9 49 22.4	48 11.1	8.2605	9.043	2.47	3.26
6	1	48.2	217	10 45 12.26	45 24.08	9 46 43.0	45 31.3	8.2626	9.045	2.45	3.25
7	1	44.7	218	10 45 38.68	45 50.56	9 44 2.8	42 50.7	8.2645	9.047	2.44	3.24
8	1	41.2	219	10 46 5.21	46 17.15	9 41 21.9	40 9.5	8.2663	9.049	2.42	3.23
9	1	37.7	220	10 46 31.85	46 43.85	9 38 40.4	37 27.6	8.2680	9.051	2.41	3.22
10	1	34.2	221	10 46 58.59	47 10.65	9 35 58.2	34 45.1	8.2697	9.052	2.39	3.20
11	1	30.7	222	10 47 25.44	47 37.55	9 33 15.4	32 2.0	8.2714	9.054	2.37	3.19
12	1	27.2	223	10 47 52.39	48 4.55	9 30 32.0	29 18.3	8.2729	9.056	2.35	3.18
13	1	23.8	224	10 48 19.43	48 31.64	9 27 48.1	26 34.1	8.2744	9.057	2.33	3.16
14	1	20.3	225	10 48 46.56	48 58.82	9 25 3.6	23 49.4	8.2758	9.058	2.31	3.14
15	1	16.8	226	10 49 13.78	49 26.09	9 22 18.6	21 4.1	8.2772	9.060	2.29	3.12
16	1	13.3	227	10 49 41.08	49 53.44	9 19 33.1	18 18.3	8.2784	9.061	2.27	3.10
17	1	9.8	228	10 50 8.46	50 20.86	9 16 47.1	15 32.0	8.2797	9.062	2.25	3.08
18	1	6.4	229	10 50 35.92	50 48.35	9 14 0.7	12 45.3	8.2808	9.063	2.23	3.06
19	0	59.4	230	10 51 3.44	51 15.91	9 11 13.9	9 58.3	8.2819	9.064	2.20	3.04
20	0	56.0	231	10 51 31.03	51 43.54	9 8 26.7	7 10.9	8.2829	9.065	2.17	3.01
21	0	52.5	232	10 51 58.68	52 11.23	9 5 39.1	4 23.1	8.2839	9.066	2.14	2.98
22	0	49.1	233	10 52 26.40	52 38.98	9 2 51.1	1 34.9	8.2848	9.067	2.11	2.95
23	0	45.6	234	10 52 54.17	53 6.78	8 60 2.8	58 46.4	8.2856	9.068	2.08	2.92
24	0	42.1	235	10 53 21.99	53 34.63	8 57 14.2	55 57.6	8.2864	9.069	2.04	2.89
25	0	38.7	236	10 53 49.86	54 2.53	8 54 25.3	53 8.5	8.2872	9.070	2.00	2.85
26	0	35.2	237	10 54 17.78	54 30.48	8 51 36.0	50 19.1	8.2879	9.071	1.95	2.81
27	0	31.8	238	10 54 45.74	54 58.47	8 48 46.5	47 29.4	8.2885	9.071	1.91	2.77
28	0	28.3	239	10 55 13.74	55 26.49	8 45 56.8	44 39.5	8.2891	9.072	1.86	2.73
29	0	24.8	240	10 55 41.78	55 54.55	8 43 6.9	41 49.4	8.2896	9.072	1.82	-2.68
30	0	21.3	241	10 56 9.85	56 22.64	8 40 16.8	38 59.2	8.2900	9.073	1.77	
31	0	17.9	242	10 56 37.94	56 50.75	8 37 26.5	36 8.8	8.2904	9.073	1.73	
			243	10 57 6.06	57 18.89	+ 8 34 36.1	33 18.3	+8.2908	-0.073	+1.68	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 0 14.4	244	10 57 34.90	57 47.05	+ 8 31' 45.5	30 27.6	+8.2911	-9.074		
2 0 10.9	245	10 58 2.36	58 15.22	8 28 54.9	27 36.9	8.2913	9.074		
3 0 7.4	246	10 58 30.53	58 43.40	8 26 4.3	24 46.2	8.2914	9.074		
4 0 4.0	247	10 58 58.70	59 11.58	8 23 13.7	21 55.5	8.2914	9.074		
5 0 0.5	248	10 59 26.87	59 39.76	8 20 23.1	19 4.9	8.2914	9.074		
5 23 57.1	249	10 59 55.04	60 7.94	8 17 32.5	16 14.3	8.2914	9.074		
6 23 53.6	250	11 0 23.21	0 36.12	8 14 41.9	13 23.7	8.2913	9.073		
7 23 50.1	251	11 0 51.37	1 4.28	8 11 51.4	10 33.2	8.2912	9.073	-1.68	+2.68
8 23 46.6	252	11 1 19.52	1 32.43	8 9 1.0	7 42.8	8.2910	9.073	1.79	2.72
9 23 43.2	253	11 1 47.65	2 0.56	8 6 10.8	4 52.6	8.2907	9.072	1.86	2.76
10 23 39.7	254	11 2 15.76	2 28.67	8 3 20.8	2 2.6	8.2903	9.072	1.91	2.80
11 23 36.3	255	11 2 43.84	2 56.75	7 60 31.0	59 12.8	8.2898	9.071	1.95	2.83
12 23 32.8	256	11 3 11.89	3 24.79	7 57 41.4	56 23.3	8.2893	9.071	1.99	2.86
13 23 29.3	257	11 3 39.90	3 52.79	7 54 52.0	53 34.0	8.2887	9.070	2.02	2.89
14 23 25.9	258	11 4 7.87	4 20.75	7 52 2.9	50 45.0	8.2881	9.069	2.05	2.92
15 23 22.4	259	11 4 35.81	4 48.68	7 49 14.1	47 56.3	8.2875	9.068	2.08	2.95
16 23 19.0	260	11 5 3.70	5 16.56	7 46 25.7	45 8.0	8.2867	9.068	2.11	2.98
17 23 15.5	261	11 5 31.54	5 44.39	7 43 37.6	42 20.0	8.2859	9.067	2.14	3.01
18 23 12.0	262	11 5 59.33	6 12.16	7 40 49.9	39 32.4	8.2851	9.066	2.17	3.04
19 23 8.6	263	11 6 27.06	6 39.87	7 38 2.5	36 45.2	8.2841	9.065	2.20	3.06
20 23 5.1	264	11 6 54.73	7 7.52	7 35 15.5	33 58.4	8.2832	9.064	2.23	3.08
21 23 1.6	265	11 7 22.34	7 35.11	7 32 28.9	31 12.0	8.2822	9.063	2.25	3.10
22 22 58.1	266	11 7 49.88	8 2.63	7 29 42.8	28 26.1	8.2811	9.061	2.27	3.12
23 22 54.7	267	11 8 17.35	8 30.07	7 26 57.2	25 40.7	8.2799	9.060	2.29	3.14
24 22 51.2	268	11 8 44.74	8 57.43	7 24 12.1	22 55.8	8.2786	9.059	2.31	3.16
25 22 47.7	269	11 9 12.05	9 24.71	7 21 27.6	20 11.5	8.2773	9.057	2.33	3.17
26 22 44.2	270	11 9 39.28	9 51.91	7 18 43.7	17 27.8	8.2760	9.055	2.35	3.19
27 22 40.8	271	11 10 6.42	10 19.02	7 16 0.4	14 44.7	8.2745	9.054	2.37	3.21
28 22 37.3	272	11 10 33.47	10 46.03	7 13 17.6	12 2.2	8.2731	9.052	2.39	3.22
29 22 33.8	273	11 11 0.43	11 12.95	7 10 35.5	9 20.4	8.2716	9.050	2.41	3.23
30 22 30.3	274	11 11 27.30	11 39.78	7 7 54.1	6 39.3	8.2701	9.048	2.42	3.25
Oct. 1 22 26.8	275	11 11 54.07	12 6.51	7 5 13.5	3 59.0	8.2684	9.046	2.44	3.27
2 22 23.4	276	11 12 20.73	12 33.13	7 2 33.6	1 19.4	8.2666	9.044	2.45	3.28
3 22 19.9	277	11 12 47.28	12 59.63	6 59 54.5	58 40.6	8.2646	9.042	2.47	3.29
4 22 16.4	278	11 13 13.70	13 26.00	6 57 16.1	56 2.6	8.2625	9.040	2.48	3.31
5 22 12.9	279	11 13 39.99	13 52.24	6 54 36.6	53 25.4	8.2604	9.037	2.49	3.32
6 22 9.4	280	11 14 6.16	14 18.36	6 52 2.0	50 49.1	8.2584	9.035	2.51	3.34
7 22 5.9	281	11 14 32.20	14 44.35	6 49 26.3	48 13.8	8.2561	9.033	2.52	3.35
8 22 2.4	282	11 14 58.10	15 10.20	6 46 51.5	45 39.4	8.2538	9.030	2.54	3.36
9 21 58.9	283	11 15 23.87	15 35.90	6 44 17.7	43 6.0	8.2515	9.027	2.55	3.37
10 21 55.4	284	11 15 49.49	16 1.46	6 41 44.9	40 33.6	8.2489	9.024	2.56	3.38
11 21 51.9	285	11 16 14.96	16 26.87	6 39 13.1	38 2.2	8.2464	9.021	2.57	3.40
12 21 48.4	286	11 16 40.28	16 52.13	6 36 42.3	35 31.8	8.2438	9.018	2.58	3.41
13 21 44.9	287	11 17 5.45	17 17.23	6 34 12.5	33 2.5	8.2411	9.015	2.59	3.42
14 21 41.4	288	11 17 30.46	17 42.17	6 31 43.9	30 34.3	8.2384	9.012	2.60	3.43
15 21 37.8	289	11 17 55.31	18 6.95	6 29 16.4	28 7.3	8.2355	9.009	2.61	3.44
16 21 34.3	290	11 18 19.99	18 31.56	6 26 50.0	25 41.4	8.2325	9.006	2.62	3.45
17 21 30.7	291	11 18 44.50	18 55.99	6 24 24.7	23 16.6	8.2294	9.002	2.63	3.46
18 21 27.2	292	11 19 8.83	19 20.25	6 22 0.6	20 53.0	8.2263	8.998	2.64	3.47
19 21 23.7	293	11 19 32.99	19 44.33	6 19 37.8	18 30.7	8.2232	8.994	2.65	3.48
20 21 20.1	294	11 19 56.98	20 8.94	6 17 16.3	16 9.8	8.2200	8.991	2.66	3.49
21 21 16.6	295	11 20 20.79	20 31.97	6 14 56.0	13 50.1	8.2166	8.987	2.67	3.50
22 21 13.1	296	11 20 44.40	20 55.50	6 12 37.0	11 31.7	8.2129	8.983	2.68	3.51
23 21 9.5	297	11 21 7.81	21 18.83	6 10 19.3	9 14.6	8.2092	8.978	2.69	3.52
24 21 6.0	298	11 21 31.02	21 41.95	6 8 3.0	6 58.9	8.2054	8.974	2.70	3.53
25 21 2.4	299	11 21 54.03	22 4.87	6 5 48.0	4 44.5	8.2017	8.970	2.70	3.54
26 20 58.9	300	11 22 16.84	22 27.58	6 3 34.4	2 31.5	8.1977	8.965	2.71	3.55
27 20 55.3	301	11 22 39.43	22 50.07	6 1 22.3	0 20.1	8.1934	8.960	2.72	3.56
28 20 51.7	302	11 23 1.80	23 12.35	5 59 11.7	58 10.2	8.1893	8.955	2.73	3.57
29 20 48.2	303	11 23 23.96	23 34.41	5 57 2.6	56 1.8	8.1850	8.950	2.74	3.58
30 20 44.6	304	11 23 45.90	23 56.24	5 54 55.0	53 54.9	8.1806	8.945	2.74	3.59
31 20 41.0	305	11 24 7.61	24 17.84	+ 5 52 49.0	51 49.6	+8.1760	-8.939	-2.75	+3.60

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 20 37.5	306	11 24 29.09	24 39.21	+ 5 50 44.7	49 46.0	+8.1712	-8.933	-2.76	+3.60
2 20 33.9	307	11 24 50.33	25 0.34	5 48 42.0	47 44.1	8.1662	8.928	2.77	3.61
3 20 30.3	308	11 25 11.32	25 21.22	5 46 40.9	45 43.8	8.1611	8.922	2.78	3.61
4 20 26.7	309	11 25 32.06	25 41.85	5 44 41.4	43 45.1	8.1568	8.916	2.78	3.62
5 20 23.1	310	11 25 52.55	26 2.22	5 42 43.6	41 48.1	8.1505	8.909	2.79	3.63
6 20 19.5	311	11 26 12.79	26 22.34	5 40 47.6	39 52.9	8.1451	8.903	2.80	3.63
7 20 15.9	312	11 26 32.77	26 42.90	5 38 53.4	37 59.5	8.1394	8.896	2.80	3.64
8 20 12.3	313	11 26 52.49	27 1.80	5 37 1.0	36 7.9	8.1336	8.889	2.81	3.64
9 20 8.7	314	11 27 11.94	27 21.13	5 35 10.4	34 18.2	8.1275	8.882	2.81	3.65
10 20 5.1	315	11 27 31.12	27 40.18	5 33 21.7	32 30.3	8.1213	8.874	2.82	3.66
11 20 1.5	316	11 27 50.02	27 58.95	5 31 34.8	30 44.3	8.1150	8.867	2.83	3.66
12 19 57.9	317	11 28 8.65	28 17.45	5 29 49.7	28 0.1	8.1086	8.859	2.84	3.67
13 19 54.2	318	11 28 27.00	28 35.67	5 28 6.5	27 17.8	8.1018	8.851	2.84	3.67
14 19 50.6	319	11 28 45.06	28 53.60	5 26 25.3	25 37.5	8.0949	8.843	2.85	3.68
15 19 46.9	320	11 29 2.83	29 11.23	5 24 46.0	23 59.1	8.0878	8.834	2.85	3.68
16 19 43.3	321	11 29 20.31	29 28.57	5 23 8.7	22 22.7	8.0806	8.825	2.86	3.69
17 19 39.6	322	11 29 37.50	29 45.62	5 21 33.5	20 48.4	8.0731	8.816	2.86	3.69
18 19 35.9	323	11 29 54.39	30 2.37	5 20 0.3	19 16.2	8.0653	8.806	2.87	3.69
19 19 32.3	324	11 30 10.97	30 18.81	5 18 29.1	17 46.1	8.0573	8.797	2.87	3.70
20 19 28.6	325	11 30 27.25	30 34.94	5 17 0.0	16 18.0	8.0491	8.786	2.88	3.70
21 19 24.9	326	11 30 43.22	30 50.76	5 15 33.0	14 52.0	8.0407	8.776	2.88	3.71
22 19 21.3	327	11 30 58.88	31 6.27	5 14 8.1	13 28.1	8.0320	8.765	2.89	3.71
23 19 17.6	328	11 31 14.22	31 21.46	5 12 45.3	12 6.3	8.0228	8.754	2.89	3.71
24 19 13.9	329	11 31 29.23	31 36.32	5 11 24.7	10 46.7	8.0132	8.742	2.90	3.72
25 19 10.2	330	11 31 43.91	31 50.84	5 10 6.3	9 29.4	8.0035	8.729	2.90	3.72
26 19 6.5	331	11 31 58.26	32 5.03	5 8 50.2	8 14.4	7.9935	8.717	2.91	3.73
27 19 2.8	332	11 32 12.28	32 18.89	5 7 36.3	7 1.6	7.9831	8.703	2.92	3.73
28 18 59.1	333	11 32 25.96	32 32.41	5 6 24.7	5 51.1	7.9723	8.689	2.92	3.73
29 18 55.4	334	11 32 39.30	32 45.59	5 5 15.4	4 42.9	7.9611	8.675	2.93	3.74
30 18 51.7	335	11 32 52.29	32 58.42	5 4 8.4	3 37.0	7.9494	8.660	2.93	3.74
Dec. 1 18 48.0	336	11 33 4.93	33 10.89	5 3 3.7	2 33.4	7.9373	8.644	2.94	3.75
2 18 44.3	337	11 33 17.22	33 23.01	5 2 1.4	1 32.2	7.9250	8.628	2.94	3.75
3 18 40.5	338	11 33 29.16	33 34.78	5 1 1.5	0 33.4	7.9121	8.610	2.94	3.75
4 18 36.8	339	11 33 40.74	33 46.19	4 60 4.0	59 37.0	7.8985	8.592	2.95	3.76
5 18 33.0	340	11 33 51.96	33 57.24	4 59 8.8	58 43.0	7.8844	8.574	2.95	3.76
6 18 29.3	341	11 34 2.81	34 7.92	4 58 16.1	57 51.5	7.8698	8.553	2.95	3.77
7 18 25.5	342	11 34 13.30	34 18.23	4 57 25.9	57 2.5	7.8545	8.532	2.96	3.77
8 18 21.7	343	11 34 23.41	34 28.16	4 56 38.1	56 15.9	7.8384	8.510	2.96	3.77
9 18 18.0	344	11 34 33.15	34 37.72	4 55 52.8	55 31.8	7.8216	8.486	2.96	3.78
10 18 14.2	345	11 34 42.51	34 46.90	4 55 9.9	54 50.1	7.8042	8.461	2.96	3.78
11 18 10.4	346	11 34 51.50	34 55.71	4 54 29.5	54 10.9	7.7864	8.434	2.97	3.78
12 18 6.6	347	11 35 0.12	35 4.15	4 53 51.6	53 34.2	7.7675	8.406	2.97	3.78
13 18 2.8	348	11 35 8.36	35 12.21	4 53 16.2	53 0.1	7.7474	8.374	2.97	3.79
14 17 59.0	349	11 35 16.22	35 19.88	4 52 43.4	52 28.5	7.7262	8.341	2.97	3.79
15 17 55.2	350	11 35 23.69	35 27.17	4 52 13.1	51 59.4	7.7038	8.305	2.97	3.79
16 17 51.4	351	11 35 30.78	35 34.07	4 51 45.3	51 32.8	7.6802	8.266	2.98	3.79
17 17 47.6	352	11 35 37.48	35 40.58	4 51 20.0	51 8.7	7.6549	8.222	2.98	3.80
18 17 43.7	353	11 35 43.79	35 46.70	4 50 57.3	50 47.2	7.6280	8.173	2.98	3.80
19 17 39.9	354	11 35 49.71	35 52.43	4 50 37.1	50 28.3	7.5990	8.118	2.98	3.80
20 17 36.0	355	11 35 55.23	35 57.76	4 50 19.5	50 12.0	7.5680	8.052	2.98	3.80
21 17 32.2	356	11 36 0.36	36 2.70	4 50 4.6	49 58.3	7.5345	7.977	2.99	3.80
22 17 28.3	357	11 36 5.09	36 7.24	4 49 52.2	49 47.1	7.4977	7.887	2.99	3.80
23 17 24.4	358	11 36 9.42	36 11.38	4 49 42.4	49 38.5	7.4576	7.771	2.99	3.80
24 17 20.6	359	11 36 13.35	36 15.11	4 49 35.2	49 32.5	7.4128	7.612	2.99	3.80
25 17 16.7	360	11 36 16.87	36 18.44	4 49 30.6	49 29.2	7.3628	7.353	2.99	3.80
26 17 12.8	361	11 36 19.99	36 21.37	4 49 28.7	49 28.6	7.3070	-6.796	2.99	3.80
27 17 9.0	362	11 36 22.71	36 23.89	4 49 29.4	49 30.6	7.2422	+7.143	2.99	3.80
28 17 5.1	363	11 36 25.02	36 26.01	4 49 32.7	49 35.1	7.1659	7.509	2.99	3.80
29 17 1.2	364	11 36 26.93	36 27.72	4 49 38.5	49 42.2	7.0734	7.702	2.99	3.80
30 16 57.3	365	11 36 28.43	36 29.03	4 49 47.0	49 51.9	6.9556	7.833	2.99	3.80
31 16 53.4	366	11 36 29.53	36 29.93	4 49 58.1	50 4.3	6.7935	7.935	2.99	3.80
32 16 49.4	367	11 36 30.22	36 30.42	+ 4 50 11.8	50 19.3	+6.5274	+8.016	-2.99	+3.79

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.															
Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
				At Sidereal Oh.		At Transit.		At Sidereal Oh.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.
Jan.	d	h m	d	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s				
	0	9 45.1	0	4 28 21.57	28 19.97	+21 44 30.8	44 36.4	-7.7810	-8.116	+2.53	+2.69				
	1	9 41.1	1	4 28 12.89	28 11.30	21 44 24.8	44 21.3	7.7760	8.106	2.55	2.71				
	2	9 37.1	2	4 28 4.36	28 2.80	21 44 6.5	44 3.1	7.7690	8.099	2.56	2.73				
	3	9 33.0	3	4 27 56.00	27 54.47	21 43 48.6	43 45.3	7.7608	8.091	2.57	2.75				
	4	9 29.0	4	4 27 47.80	27 46.30	21 43 31.2	43 27.9	7.7524	8.083	2.58	2.77				
	5	9 24.9	5	4 27 39.75	27 38.28	21 43 14.0	43 10.9	7.7437	8.074	2.59	2.79				
	6	9 20.9	6	4 27 31.85	27 30.40	21 42 57.1	42 54.2	7.7347	8.065	2.60	2.81				
	7	9 16.8	7	4 27 24.11	27 22.69	21 42 40.6	42 37.8	7.7255	8.055	2.60	2.83				
	8	9 12.8	8	4 27 16.54	27 15.15	21 42 24.5	42 21.8	7.7160	8.045	2.61	2.85				
	9	9 8.7	9	4 27 9.14	27 7.78	21 42 8.8	42 6.1	7.7062	8.034	2.61	2.87				
	10	9 4.7	10	4 27 1.91	27 0.59	21 41 53.4	41 50.6	7.6960	8.023	2.62	2.88				
	11	9 0.6	11	4 26 54.85	26 53.56	21 41 38.4	41 35.6	7.6852	8.012	2.62	2.89				
	12	8 56.6	12	4 26 47.97	26 46.71	21 41 23.8	41 21.1	7.6739	8.000	2.63	2.90				
	13	8 52.5	13	4 26 41.27	26 40.04	21 41 9.6	41 7.0	7.6622	7.988	2.63	2.91				
	14	8 48.5	14	4 26 34.75	26 33.55	21 40 55.9	40 53.3	7.6500	7.975	2.64	2.92				
	15	8 44.5	15	4 26 28.40	26 27.25	21 40 42.6	40 40.1	7.6376	7.962	2.64	2.93				
	16	8 40.4	16	4 26 22.23	26 21.12	21 40 29.6	40 27.2	7.6246	7.948	2.65	2.94				
	17	8 36.4	17	4 26 16.25	26 15.18	21 40 17.0	40 14.7	7.6111	7.934	2.65	2.95				
	18	8 32.4	18	4 26 10.46	26 9.43	21 40 4.8	40 2.6	7.5971	7.920	2.66	2.96				
	19	8 28.3	19	4 26 4.86	26 3.87	21 39 53.0	39 50.9	7.5826	7.906	2.66	2.97				
	20	8 24.3	20	4 25 59.44	25 58.49	21 39 41.5	39 39.5	7.5676	7.890	2.67	2.97				
	21	8 20.3	21	4 25 54.22	25 53.33	21 39 30.5	39 28.5	7.5513	7.874	2.67	2.98				
	22	8 16.3	22	4 25 49.21	25 48.37	21 39 20.0	39 18.0	7.5336	7.856	2.68	2.98				
	23	8 12.3	23	4 25 44.41	25 43.61	21 39 10.0	39 8.0	7.5145	7.836	2.68	2.99				
	24	8 8.3	24	4 25 39.80	25 39.05	21 39 0.5	38 58.6	7.4939	7.814	2.69	2.99				
	25	8 4.3	25	4 25 35.46	25 34.70	21 38 51.3	38 49.7	7.4721	7.791	2.69	2.99				
	26	8 0.3	26	4 25 31.29	25 30.56	21 38 42.6	38 41.2	7.4509	7.767	2.70	3.00				
	27	7 56.3	27	4 25 27.32	25 26.62	21 38 34.4	38 33.1	7.4283	7.742	2.70	3.00				
	28	7 52.3	28	4 25 23.55	25 22.88	21 38 26.7	38 25.4	7.4049	7.716	2.71	3.01				
	29	7 48.3	29	4 25 19.97	25 19.34	21 38 19.5	38 18.1	7.3805	7.689	2.71	3.01				
	30	7 44.3	30	4 25 16.59	25 16.01	21 38 12.6	38 11.4	7.3549	7.661	2.71	3.02				
	31	7 40.4	31	4 25 13.44	25 12.89	21 38 6.2	38 5.1	7.3271	7.627	2.72	3.02				
Feb.	1	7 36.4	32	4 25 10.51	25 9.99	21 38 0.3	37 59.3	7.2953	7.589	2.72	3.03				
	2	7 32.4	33	4 25 7.80	25 7.31	21 37 54.9	37 54.0	7.2595	7.547	2.72	3.03				
	3	7 28.5	34	4 25 5.30	25 4.85	21 37 50.0	37 49.2	7.2197	7.500	2.72	3.04				
	4	7 24.5	35	4 25 3.02	25 2.63	21 37 45.8	37 45.1	7.1761	7.454	2.72	3.04				
	5	7 20.5	36	4 25 0.97	25 0.62	21 37 41.9	37 41.3	7.1295	7.397	2.72	3.05				
	6	7 16.5	37	4 24 59.14	24 58.83	21 37 38.5	37 38.0	7.0746	7.333	2.72	3.05				
	7	7 12.6	38	4 24 57.53	24 57.26	21 37 35.6	37 35.2	7.0177	7.256	2.72	3.06				
	8	7 8.6	39	4 24 56.14	24 55.91	21 37 33.2	37 32.9	6.9489	7.164	2.72	3.06				
	9	7 4.6	40	4 24 54.97	24 54.79	21 37 31.3	37 31.1	6.8670	7.045	2.72	3.07				
	10	7 0.6	41	4 24 54.02	24 53.89	21 37 29.9	37 29.8	6.7555	6.883	2.72	3.07				
	11	6 56.7	42	4 24 53.30	24 53.22	21 37 29.0	37 27.0	6.6198	6.620	2.71	3.07				
	12	6 52.8	43	4 24 52.81	24 52.78	21 37 28.6	37 28.7	6.4214	-6.319	2.71	3.07				
	13	6 48.9	44	4 24 52.55	24 52.56	21 37 28.7	37 28.9	-6.9878	-6.444	2.71	3.07				
	14	6 45.0	45	4 24 52.53	24 52.57	21 37 29.3	37 29.5	+5.8417	6.796	2.71	3.07				
	15	6 41.0	46	4 24 52.74	24 52.81	21 37 30.4	37 30.7	6.3602	6.988	2.71	3.07				
	16	6 37.2	47	4 24 53.17	24 53.27	21 37 32.0	37 32.4	6.5740	7.120	2.70	3.06				
	17	6 33.2	48	4 24 53.82	24 53.95	21 37 34.1	37 34.6	6.7225	7.203	2.70	3.06				
	18	6 29.3	49	4 24 54.69	24 54.84	21 37 36.7	37 37.3	6.8984	7.332	2.70	3.06				
	19	6 25.3	50	4 24 55.78	24 55.97	21 37 40.0	37 40.7	6.9280	7.396	2.69	3.05				
	20	6 21.4	51	4 24 57.11	24 57.35	21 37 43.7	37 44.4	7.0000	7.433	2.69	3.05				
	21	6 17.5	52	4 24 58.66	24 58.95	21 37 47.8	37 48.6	7.0618	7.486	2.69	3.05				
	22	6 13.6	53	4 25 0.43	25 0.77	21 37 52.4	37 53.3	7.1158	7.532	2.69	3.04				
	23	6 9.7	54	4 25 2.42	25 2.81	21 37 57.5	37 58.5	7.1640	7.574	2.69	3.04				
	24	6 5.8	55	4 25 4.63	25 5.07	21 38 3.1	38 4.2	7.2072	7.612	2.68	3.04				
	25	6 1.9	56	4 25 7.06	25 7.55	21 38 9.2	38 10.4	7.2450	7.648	2.68	3.03				
	26	5 58.0	57	4 25 9.71	25 10.25	21 38 15.8	38 17.1	7.2812	7.682	2.68	3.03				
	27	5 54.1	58	4 25 12.58	25 13.17	21 38 22.9	38 24.3	7.3154	7.713	2.68	3.02				
	28	5 50.2	59	4 25 15.68	25 16.31	21 38 30.5	38 32.0	7.3476	7.744	2.67	3.02				
	29	5 46.4	60	4 25 19.00	25 19.66	21 38 38.8	38 40.4	7.3782	7.771	2.67	3.01				
	30	5 42.5	61	4 25 22.55	25 23.24	+21 38 47.5	38 49.2	+7.4063	+7.797	+2.67	+3.01				

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t ² .		
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
Mar. 1	d 5 46.4	60	4 25 19.00	25 19.66	+21 38 38.8	38 40.4	+7.3782	+7.771	+2.67	+3.01
2	5 42.5	61	4 25 22.55	25 23.24	21 38 47.5	38 49.2	7.4063	7.797	2.67	3.01
3	5 38.6	62	4 25 26.32	25 27.05	21 38 56.7	38 58.5	7.4324	7.820	2.67	3.00
4	5 34.8	63	4 25 30.31	25 31.08	21 39 6.4	39 8.3	7.4565	7.842	2.67	2.99
5	5 30.9	64	4 25 34.51	25 35.33	21 39 16.6	39 18.6	7.4786	7.861	2.66	2.99
6	5 27.0	65	4 25 38.95	25 39.80	21 39 27.2	39 29.2	7.4987	7.879	2.66	2.98
7	5 23.2	66	4 25 43.59	25 44.48	21 39 38.3	39 40.4	7.5178	7.896	2.66	2.98
8	5 19.3	67	4 25 48.44	25 49.37	21 39 49.9	39 52.1	7.5363	7.913	2.66	2.98
9	5 15.5	68	4 25 53.50	25 54.47	21 40 2.0	40 4.3	7.5542	7.930	2.66	2.97
10	5 11.6	69	4 25 58.77	25 59.78	21 40 14.5	40 17.0	7.5715	7.946	2.65	2.97
11	5 7.8	70	4 26 4.94	26 5.29	21 40 27.6	40 30.1	7.5883	7.962	2.65	2.97
12	5 3.9	71	4 26 9.92	26 11.00	21 40 41.1	40 43.6	7.6044	7.977	2.65	2.96
13	5 0.1	72	4 26 15.80	26 16.92	21 40 55.0	40 57.5	7.6200	7.991	2.65	2.96
14	4 56.3	73	4 26 21.89	26 23.05	21 41 9.3	41 11.9	7.6351	8.004	2.65	2.96
15	4 52.5	74	4 26 28.19	26 29.39	21 41 24.0	41 26.7	7.6497	8.017	2.64	2.95
16	4 48.7	75	4 26 34.71	26 35.95	21 41 39.0	41 41.9	7.6639	8.029	2.64	2.95
17	4 44.9	76	4 26 41.45	26 42.71	21 41 54.4	41 57.5	7.6772	8.040	2.64	2.94
18	4 41.1	77	4 26 48.38	26 49.67	21 42 10.3	42 13.5	7.6897	8.051	2.64	2.94
19	4 37.3	78	4 26 55.50	26 56.83	21 42 26.7	42 29.9	7.7014	8.062	2.64	2.93
20	4 33.4	79	4 27 2.81	27 4.19	21 42 43.5	42 46.8	7.7123	8.073	2.63	2.93
21	4 29.6	80	4 27 10.31	27 11.73	21 43 0.8	43 4.1	7.7225	8.082	2.63	2.92
22	4 25.8	81	4 27 18.01	27 19.46	21 43 18.4	43 21.8	7.7326	8.092	2.63	2.91
23	4 22.0	82	4 27 25.91	27 27.38	21 43 36.4	43 39.9	7.7426	8.101	2.63	2.90
24	4 18.2	83	4 27 33.99	27 35.49	21 43 54.8	43 58.4	7.7525	8.109	2.62	2.90
25	4 14.4	84	4 27 42.25	27 43.79	21 44 13.7	44 17.3	7.7622	8.118	2.62	2.89
26	4 10.6	85	4 27 50.67	27 52.28	21 44 33.0	44 36.7	7.7721	8.126	2.62	2.88
27	4 6.8	86	4 27 59.28	28 0.94	21 44 52.7	44 56.4	7.7815	8.135	2.61	2.87
28	4 3.0	87	4 28 8.07	28 9.77	21 45 12.7	45 16.4	7.7905	8.143	2.61	2.86
29	3 59.2	88	4 28 17.04	28 18.77	21 45 33.0	45 36.7	7.7992	8.151	2.61	2.86
30	3 55.4	89	4 28 26.19	28 27.94	21 45 53.6	45 57.4	7.8076	8.158	2.60	2.85
31	3 51.7	90	4 28 35.53	28 37.30	21 46 14.5	46 18.4	7.8157	8.166	2.60	2.84
Apr. 1	3 48.0	91	4 28 45.04	28 46.85	21 46 35.6	46 39.8	7.8232	8.173	2.59	2.83
2	3 44.2	92	4 28 54.71	28 56.56	21 46 57.2	47 1.5	7.8304	8.180	2.59	2.81
3	3 40.4	93	4 29 4.54	29 6.43	21 47 19.1	47 23.5	7.8373	8.187	2.58	2.80
4	3 36.7	94	4 29 14.53	29 16.46	21 47 41.4	47 45.8	7.8439	8.194	2.58	2.79
5	3 32.9	95	4 29 24.69	29 26.65	21 48 4.0	48 8.3	7.8500	8.198	2.57	2.78
6	3 29.2	96	4 29 35.03	29 37.01	21 48 26.8	48 31.2	7.8564	8.204	2.57	2.77
7	3 25.4	97	4 29 45.52	29 47.52	21 48 49.9	48 54.4	7.8628	8.210	2.56	2.76
8	3 21.7	98	4 29 56.16	29 58.18	21 49 13.3	49 17.9	7.8692	8.216	2.55	2.75
9	3 17.9	99	4 30 8.95	30 8.99	21 49 37.0	49 41.7	7.8756	8.222	2.55	2.74
10	3 14.1	100	4 30 17.88	30 19.96	21 50 1.1	50 5.7	7.8820	8.227	2.54	2.73
11	3 10.4	101	4 30 29.01	30 31.10	21 50 25.5	50 29.9	7.8882	8.232	2.53	2.72
12	3 6.7	102	4 30 40.27	30 42.36	21 50 50.1	50 54.4	7.8942	8.237	2.52	2.71
13	3 2.9	103	4 30 51.66	30 53.78	21 51 14.9	51 19.2	7.9000	8.242	2.51	2.70
14	2 59.2	104	4 31 3.17	31 5.34	21 51 39.9	51 44.4	7.9056	8.247	2.50	2.69
15	2 55.5	105	4 31 14.81	31 17.04	21 52 5.1	52 9.9	7.9108	8.250	2.49	2.67
16	2 51.7	106	4 31 26.61	31 28.86	21 52 30.6	52 35.5	7.9160	8.253	2.48	2.65
17	2 48.0	107	4 31 38.54	31 40.81	21 52 56.3	53 1.3	7.9210	8.256	2.47	2.64
18	2 44.2	108	4 31 50.60	31 52.89	21 53 22.2	53 27.3	7.9258	8.259	2.46	2.62
19	2 40.5	109	4 32 2.79	32 5.10	21 53 48.4	53 53.5	7.9304	8.262	2.45	2.60
20	2 36.7	110	4 32 15.09	32 17.44	21 54 14.8	54 19.8	7.9346	8.266	2.44	2.59
21	2 33.0	111	4 32 27.54	32 29.91	21 54 41.5	54 46.4	7.9388	8.269	2.42	2.57
22	2 29.2	112	4 32 40.11	32 42.50	21 55 8.3	55 13.2	7.9430	8.272	2.41	2.55
23	2 25.5	113	4 32 52.79	32 55.21	21 55 35.2	55 40.2	7.9471	8.275	2.40	2.53
24	2 21.8	114	4 33 5.58	33 8.04	21 56 2.2	56 7.4	7.9511	8.278	2.39	2.51
25	2 18.1	115	4 33 18.50	33 20.97	21 56 29.5	56 34.7	7.9552	8.280	2.38	2.49
26	2 14.4	116	4 33 31.52	33 34.00	21 56 56.9	57 2.1	7.9593	8.282	2.36	2.47
27	2 10.7	117	4 33 34.64	33 47.13	21 57 24.5	57 29.7	7.9634	8.284	2.35	2.44
28	2 7.0	118	4 33 47.86	34 0.37	21 57 52.3	57 57.5	7.9674	8.286	2.33	2.42
29	2 3.3	119	4 34 1.18	34 13.71	21 58 20.3	58 25.6	7.9713	8.288	2.32	2.39
30	1 59.6	120	4 34 24.59	34 27.17	21 58 48.4	58 53.7	7.9752	8.290	2.31	+2.37
31	1 55.9	121	4 34 38.12	34 40.72	+21 59 16.6	59 21.9	+7.9748	+8.292	+2.30	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
May	d h m	d h m s	m s	° ' "	° ' "						
1	1 55.9	121 4 34 38.12	34 40.72	+21 59 16.6	59 21.9	+7.9748	+8.292	+2.30			
2	1 52.2	122 4 34 51.74	34 54.36	21 59 44.9	59 50.2	7.9781	8.294	2.29			
3	1 48.5	123 4 35 5.45	35 8.09	22 0 13.3	0 18.6	7.9811	8.296	2.28			
4	1 44.8	124 4 35 19.25	35 21.91	22 0 41.8	0 47.0	7.9838	8.297	2.27			
5	1 41.1	125 4 35 33.16	35 35.84	22 1 10.2	1 15.5	7.9864	8.298	2.26			
6	1 37.4	126 4 35 47.15	35 49.85	22 1 38.8	1 44.1	7.9888	8.299	2.24			
7	1 33.7	127 4 36 1.21	36 3.93	22 2 7.5	2 12.8	7.9911	8.300	2.22			
8	1 30.0	128 4 36 15.34	36 18.08	22 2 36.3	2 41.6	7.9933	8.301	2.20			
9	1 26.3	129 4 36 29.54	36 32.30	22 3 5.2	3 10.5	7.9954	8.302	2.18			
10	1 22.6	130 4 36 43.81	36 46.57	22 3 34.1	3 39.5	7.9972	8.304	2.17			
11	1 19.0	131 4 36 58.15	37 0.91	22 4 3.1	4 8.6	7.9991	8.305	2.15			
12	1 15.3	132 4 37 12.55	37 15.31	22 4 32.2	4 37.7	8.0010	8.305	2.13			
13	1 11.6	133 4 37 27.00	37 29.77	22 5 1.3	5 6.8	8.0028	8.306	2.11			
14	1 7.9	134 4 37 41.51	37 44.30	22 5 30.4	5 35.9	8.0045	8.307	2.09			
15	1 4.2	135 4 37 56.07	37 58.89	22 5 59.5	6 4.9	8.0060	8.307	2.07			
16	1 0.5	136 4 38 10.70	38 13.53	22 6 28.7	6 34.0	8.0077	8.307	2.04			
17	0 56.8	137 4 38 25.38	38 28.22	22 6 57.9	7 3.2	8.0093	8.307	2.01			
18	0 53.1	138 4 38 40.11	38 42.96	22 7 27.1	7 32.4	8.0108	8.307	1.98			
19	0 49.4	139 4 38 54.89	38 57.76	22 7 56.3	8 1.6	8.0122	8.306	1.94			
20	0 45.7	140 4 39 9.72	39 12.61	22 8 25.5	8 30.9	8.0133	8.306	+1.90			
21	0 42.1	141 4 39 24.59	39 27.49	22 8 54.6	9 0.1	8.0144	8.306				
22	0 38.4	142 4 39 39.49	39 42.40	22 9 23.7	9 29.3	8.0154	8.305				
23	0 34.7	143 4 39 54.42	39 57.34	22 9 52.8	9 58.4	8.0163	8.305				
24	0 31.0	144 4 40 9.38	40 12.31	22 10 21.9	10 27.5	8.0171	8.304				
25	0 27.3	145 4 40 24.37	40 27.29	22 10 51.1	10 56.5	8.0177	8.304				
26	0 23.7	146 4 40 39.38	40 42.30	22 11 20.2	11 25.5	8.0186	8.303				
27	0 20.0	147 4 40 54.41	40 57.34	22 11 49.2	11 54.5	8.0194	8.303				
28	0 16.3	148 4 41 9.46	41 12.40	22 12 18.1	12 23.4	8.0201	8.302				
29	0 12.6	149 4 41 24.53	41 27.48	22 12 46.9	12 52.1	8.0208	8.301				
30	0 8.9	150 4 41 39.63	41 42.58	22 13 15.5	13 20.8	8.0211	8.300				
31	0 5.2	151 4 41 54.75	41 57.69	22 13 44.1	13 49.5	8.0211	8.299				
June 1	0 1.5	152 4 42 9.87	42 12.81	22 14 12.7	14 18.1	8.0212	8.298				
1	23 57.9	153 4 42 24.99	42 27.93	22 14 41.3	14 46.7	8.0212	8.297				
2	23 54.2	154 4 42 40.11	42 43.06	22 15 9.9	15 15.2	8.0211	8.296				
3	23 50.5	155 4 42 55.23	42 58.20	22 15 38.4	15 43.7	8.0211	8.294				
4	23 46.8	156 4 43 10.35	43 13.33	22 16 6.8	16 12.0	8.0210	8.292				
5	23 43.1	157 4 43 25.47	43 28.45	22 16 35.1	16 40.2	8.0209	8.290				
6	23 39.4	158 4 43 40.59	43 43.57	22 17 3.2	17 8.3	8.0207	8.288				
7	23 35.7	159 4 43 55.71	43 58.68	22 17 31.1	17 36.3	8.0204	8.286				
8	23 32.0	160 4 44 10.81	44 13.78	22 17 59.0	18 4.2	8.0202	8.285				-2.37
9	23 28.4	161 4 44 25.89	44 28.86	22 18 26.8	18 32.0	8.0195	8.283				2.39
10	23 24.7	162 4 44 40.94	44 43.91	22 18 54.4	18 59.6	8.0187	8.281				2.42
11	23 21.0	163 4 44 55.96	44 58.93	22 19 21.8	19 27.0	8.0178	8.279				2.44
12	23 17.3	164 4 45 10.95	45 13.92	22 19 49.1	19 54.2	8.0168	8.277				2.47
13	23 13.6	165 4 45 25.90	45 28.86	22 20 16.2	20 21.3	8.0157	8.275	-1.90			2.49
14	23 10.0	166 4 45 40.82	45 43.77	22 20 43.2	20 48.3	8.0146	8.273	1.94			2.51
15	23 6.3	167 4 45 55.71	45 58.65	22 21 10.1	21 15.2	8.0135	8.271	1.98			2.53
16	23 2.6	168 4 46 10.57	46 13.50	22 21 36.8	21 41.9	8.0123	8.269	2.01			2.55
17	22 58.9	169 4 46 25.40	46 28.32	22 22 3.3	22 8.4	8.0110	8.266	2.04			2.57
18	22 55.2	170 4 46 40.19	46 43.10	22 22 29.8	22 34.8	8.0100	8.263	2.07			2.59
19	22 51.5	171 4 46 54.91	46 57.83	22 22 56.1	23 1.0	8.0087	8.260	2.10			2.61
20	22 47.8	172 4 47 9.58	47 12.50	22 23 22.2	23 27.1	8.0074	8.257	2.12			2.63
21	22 44.1	173 4 47 24.20	47 27.11	22 23 48.1	23 53.0	8.0060	8.254	2.14			2.65
22	22 40.4	174 4 47 38.77	47 41.67	22 24 13.8	24 18.7	8.0045	8.251	2.16			2.66
23	22 36.8	175 4 47 53.29	47 56.18	22 24 39.4	24 44.2	8.0030	8.248	2.17			2.67
24	22 33.1	176 4 48 7.76	48 10.64	22 25 4.8	25 9.6	8.0013	8.245	2.19			2.67
25	22 29.4	177 4 48 22.17	48 25.04	22 25 30.0	25 34.8	7.9994	8.242	2.20			2.68
26	22 25.7	178 4 48 36.52	48 39.38	22 25 55.1	25 59.8	7.9974	8.239	2.21			2.68
27	22 22.0	179 4 48 50.84	48 53.66	22 26 20.0	26 24.6	7.9953	8.236	2.23			2.69
28	22 18.3	180 4 49 5.06	49 7.90	22 26 44.7	26 49.3	7.9932	8.233	2.24			2.69
29	22 14.6	181 4 49 19.23	49 22.01	22 27 9.1	27 13.9	7.9910	8.229	2.25			2.70
30	22 10.9	182 4 49 33.29	49 36.05	+22 27 33.3	27 38.1	+7.9887	+8.225	-2.27			-2.70

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July 1 22 7.2	183	4 49 47.94	49 50.01	+22 27 57.3	28 21	+7.9863	+8.221	-2.28	-2.70
2 22 3.5	184	4 50 1.12	50 3.89	22 28 21.1	28 25.9	7.9838	8.217	2.30	2.71
3 21 59.8	185	4 50 14.93	50 17.71	22 28 44.7	28 49.4	7.9811	8.211	2.32	2.71
4 21 56.1	186	4 50 28.67	50 31.44	22 29 8.0	29 12.7	7.9782	8.207	2.33	2.71
5 21 52.4	187	4 50 42.31	50 45.07	22 29 31.1	29 35.8	7.9752	8.202	2.34	2.72
6 21 48.7	188	4 50 55.86	50 58.60	22 29 54.0	29 58.6	7.9721	8.198	2.36	2.72
7 21 45.0	189	4 51 9.31	51 12.03	22 30 16.7	30 21.2	7.9689	8.194	2.37	2.72
8 21 41.3	190	4 51 22.66	51 25.35	22 30 39.2	30 43.6	7.9658	8.190	2.39	2.73
9 21 37.6	191	4 51 35.92	51 38.57	22 31 1.4	31 5.8	7.9626	8.186	2.40	2.73
10 21 33.9	192	4 51 49.07	51 51.69	22 31 23.4	31 27.8	7.9592	8.181	2.41	2.73
11 21 30.2	193	4 52 2.11	52 4.71	22 31 45.1	31 49.5	7.9556	8.176	2.43	2.74
12 21 26.4	194	4 52 15.04	52 17.63	22 32 6.6	32 10.9	7.9518	8.171	2.44	2.74
13 21 22.7	195	4 52 27.87	52 30.47	22 32 27.8	32 32.0	7.9478	8.166	2.45	2.75
14 21 19.0	196	4 52 40.58	52 43.17	22 32 48.8	32 53.0	7.9438	8.161	2.46	2.75
15 21 15.2	197	4 52 53.17	52 55.74	22 33 9.6	33 13.8	7.9398	8.156	2.47	2.75
16 21 11.5	198	4 53 5.64	53 8.18	22 33 30.2	33 34.4	7.9357	8.151	2.49	2.76
17 21 7.8	199	4 53 17.98	53 20.49	22 33 50.6	33 54.7	7.9315	8.145	2.50	2.76
18 21 4.1	200	4 53 30.20	53 32.69	22 34 10.6	34 14.6	7.9272	8.140	2.51	2.77
19 21 0.3	201	4 53 42.32	53 44.77	22 34 30.4	34 34.4	7.9227	8.134	2.52	2.77
20 20 56.6	202	4 53 54.31	53 56.72	22 34 49.9	34 53.9	7.9181	8.128	2.52	2.77
21 20 52.9	203	4 54 6.16	54 8.54	22 35 9.1	35 13.0	7.9133	8.122	2.53	2.78
22 20 49.1	204	4 54 17.87	54 20.23	22 35 28.0	35 32.8	7.9083	8.116	2.53	2.78
23 20 45.4	205	4 54 29.45	54 31.80	22 35 46.6	35 50.3	7.9032	8.109	2.54	2.78
24 20 41.6	206	4 54 40.90	54 43.22	22 36 5.0	36 8.7	7.8979	8.104	2.54	2.79
25 20 37.9	207	4 54 52.20	54 54.49	22 36 23.2	36 26.9	7.8924	8.099	2.55	2.79
26 20 34.1	208	4 55 3.35	55 5.61	22 36 41.1	36 44.7	7.8868	8.093	2.56	2.79
27 20 30.4	209	4 55 14.35	55 16.58	22 36 58.7	37 2.2	7.8811	8.088	2.56	2.80
28 20 26.7	210	4 55 25.22	55 27.41	22 37 16.0	37 19.5	7.8754	8.077	2.57	2.80
29 20 23.0	211	4 55 35.95	55 38.11	22 37 33.1	37 36.4	7.8693	8.070	2.57	2.80
30 20 19.2	212	4 55 46.52	55 48.65	22 37 49.9	37 53.4	7.8630	8.063	2.58	2.81
31 20 15.4	213	4 55 56.93	55 59.03	22 38 6.4	38 9.8	7.8565	8.056	2.59	2.81
Aug. 1 20 11.6	214	4 56 7.18	56 9.25	22 38 22.5	38 25.8	7.8498	8.049	2.59	2.81
2 20 7.9	215	4 56 17.27	56 19.31	22 38 38.3	38 41.5	7.8431	8.042	2.60	2.82
3 20 4.1	216	4 56 27.22	56 29.23	22 38 53.9	38 57.1	7.8359	8.034	2.60	2.82
4 20 0.3	217	4 56 37.00	56 38.98	22 39 9.2	39 12.3	7.8285	8.026	2.61	2.82
5 19 56.6	218	4 56 46.61	56 48.56	22 39 24.3	39 27.3	7.8209	8.018	2.62	2.82
6 19 52.8	219	4 56 56.05	56 57.97	22 39 39.1	39 42.1	7.8131	8.010	2.62	2.82
7 19 49.0	220	4 57 5.32	57 7.21	22 39 53.7	39 56.7	7.8049	8.000	2.63	2.83
8 19 45.2	221	4 57 14.42	57 16.27	22 40 7.9	40 10.9	7.7963	7.990	2.63	2.83
9 19 41.4	222	4 57 23.34	57 25.15	22 40 21.8	40 24.7	7.7874	7.980	2.64	2.83
10 19 37.6	223	4 57 32.08	57 33.85	22 40 35.4	40 38.3	7.7783	7.970	2.64	2.83
11 19 33.8	224	4 57 40.64	57 42.37	22 40 48.7	40 51.5	7.7690	7.960	2.65	2.83
12 19 30.0	225	4 57 49.01	57 50.71	22 41 1.6	41 4.3	7.7596	7.949	2.65	2.84
13 19 26.2	226	4 57 57.20	57 58.86	22 41 14.3	41 16.9	7.7498	7.938	2.65	2.84
14 19 22.4	227	4 58 5.20	58 6.82	22 41 26.7	41 29.2	7.7397	7.927	2.66	2.84
15 19 18.6	228	4 58 13.01	58 14.50	22 41 38.8	41 41.3	7.7293	7.916	2.66	2.84
16 19 14.8	229	4 58 20.62	58 22.17	22 41 50.7	41 53.1	7.7186	7.905	2.66	2.84
17 19 11.0	230	4 58 28.04	58 29.55	22 42 2.3	42 4.7	7.7078	7.894	2.67	2.85
18 19 7.2	231	4 58 35.29	58 36.75	22 42 13.5	42 15.9	7.6966	7.882	2.67	2.85
19 19 3.4	232	4 58 42.35	58 43.77	22 42 24.4	42 26.8	7.6850	7.870	2.68	2.85
20 18 59.5	233	4 58 49.21	58 50.60	22 42 35.0	42 37.0	7.6730	7.858	2.68	2.85
21 18 55.7	234	4 58 55.87	58 57.24	22 42 45.3	42 47.3	7.6606	7.846	2.68	2.85
22 18 51.9	235	4 59 2.36	59 3.67	22 42 55.3	42 57.3	7.6478	7.833	2.69	2.86
23 18 48.1	236	4 59 8.66	59 9.92	22 43 5.0	43 7.0	7.6341	7.818	2.69	2.86
24 18 44.2	237	4 59 14.75	59 15.96	22 43 14.4	43 16.4	7.6194	7.803	2.69	2.86
25 18 40.4	238	4 59 20.63	59 21.79	22 43 23.5	43 25.5	7.6037	7.788	2.69	2.86
26 18 36.6	239	4 59 26.30	59 27.41	22 43 32.3	43 34.2	7.5870	7.773	2.70	2.86
27 18 32.8	240	4 59 31.75	59 32.84	22 43 40.7	43 42.4	7.5691	7.756	2.70	2.87
28 18 29.0	241	4 59 36.99	59 38.04	22 43 48.8	43 50.4	7.5516	7.739	2.70	2.87
29 18 25.1	242	4 59 42.02	59 43.03	22 43 52.6	43 58.1	7.5336	7.722	2.70	2.87
30 18 21.3	243	4 59 46.84	59 47.81	22 44 4.1	44 5.5	7.5150	7.704	2.70	2.87
31 18 17.4	244	4 59 51.45	59 52.38	+22 44 11.3	44 12.7	+7.4959	+7.686	-2.71	-2.87

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 18 13.6	245	4 59 55.86	59 56.73	+22 44 18.2	44 19.6	+7.4760	+7.668	-2.71	-2.88
2 18 9.7	246	5 0 0.06	0 0.89	22 44 24.8	44 26.2	7.4547	7.644	2.71	2.88
3 18 5.9	247	5 0 4.04	0 4.83	22 44 31.1	44 32.4	7.4314	7.620	2.71	2.88
4 18 2.0	248	5 0 7.80	0 38.55	22 44 37.6	44 38.3	7.4061	7.596	2.71	2.88
5 17 58.1	249	5 0 11.34	0 12.05	22 44 42.8	44 43.8	7.3788	7.572	2.71	2.88
6 17 54.2	250	5 0 14.66	0 15.32	22 44 48.0	44 49.0	7.3494	7.549	2.71	2.89
7 17 50.3	251	5 0 17.77	0 18.38	22 44 53.0	44 53.9	7.3156	7.517	2.71	2.89
8 17 46.4	252	5 0 20.67	0 21.23	22 44 57.7	44 58.5	7.2788	7.485	2.72	2.89
9 17 42.5	253	5 0 23.35	0 23.86	22 45 2.1	45 2.8	7.2188	7.453	2.72	2.89
10 17 38.6	254	5 0 25.81	0 26.27	22 45 6.2	45 6.9	7.1752	7.420	2.72	2.89
11 17 34.7	255	5 0 28.04	0 28.46	22 45 9.9	45 10.6	7.1700	7.386	2.72	2.90
12 17 30.8	256	5 0 30.06	0 30.43	22 45 13.3	45 14.0	7.1152	7.337	2.72	2.90
13 17 26.9	257	5 0 31.86	0 32.18	22 45 16.4	45 17.0	7.0554	7.288	2.72	2.90
14 17 23.0	258	5 0 33.44	0 33.71	22 45 19.2	45 19.7	6.9906	7.239	2.72	2.90
15 17 19.1	259	5 0 34.80	0 35.02	22 45 21.7	45 22.1	6.9208	7.190	2.72	2.90
16 17 15.2	260	5 0 35.92	0 36.11	22 45 23.9	45 24.3	6.8460	7.143	2.72	2.90
17 17 11.3	261	5 0 36.82	0 36.98	22 45 25.7	45 26.1	6.7393	7.063	2.72	2.91
18 17 7.4	262	5 0 37.50	0 37.62	22 45 27.2	45 27.5	6.5974	6.963	2.72	2.91
19 17 3.4	263	5 0 37.96	0 38.03	22 45 28.4	45 28.6	6.3856	6.843	2.71	2.91
20 16 59.5	264	5 0 38.20	0 38.21	22 45 29.3	45 29.4	+5.9955	6.703	2.71	2.91
21 16 55.6	265	5 0 38.22	0 38.16	22 45 30.0	45 30.0	-5.8869	6.540	2.71	2.91
22 16 51.7	266	5 0 38.01	0 37.90	22 45 30.3	45 30.2	6.3467	+6.200	2.71	2.91
23 16 47.8	267	5 0 37.58	0 37.43	22 45 30.2	45 30.1	6.5740	-6.250	2.71	2.91
24 16 43.8	268	5 0 36.93	0 36.75	22 45 29.8	45 29.7	6.7167	6.644	2.71	2.91
25 16 39.9	269	5 0 36.07	0 35.86	22 45 29.1	45 29.0	6.8283	6.735	2.71	2.91
26 16 35.9	270	5 0 34.99	0 34.74	22 45 28.2	45 28.0	6.9205	6.883	2.70	2.90
27 16 32.0	271	5 0 33.68	0 33.39	22 45 26.9	45 26.6	6.9900	7.003	2.70	2.90
28 16 28.0	272	5 0 32.15	0 31.81	22 45 25.3	45 24.9	7.0564	7.105	2.70	2.90
29 16 24.0	273	5 0 30.40	0 30.00	22 45 23.4	45 23.0	7.1087	7.184	2.70	2.89
30 16 20.0	274	5 0 28.43	0 27.96	22 45 21.2	45 20.7	7.1508	7.237	2.70	2.89
Oct. 1 16 16.1	275	5 0 26.22	0 25.71	22 45 18.7	45 18.1	7.2090	7.273	2.69	2.88
2 16 12.1	276	5 0 23.78	0 23.24	22 45 15.8	45 15.1	7.2476	7.315	2.69	2.88
3 16 8.1	277	5 0 21.13	0 20.55	22 45 12.6	45 11.9	7.2832	7.355	2.69	2.88
4 16 4.2	278	5 0 18.27	0 17.65	22 45 9.1	45 8.4	7.3158	7.393	2.69	2.87
5 16 0.2	279	5 0 15.20	0 14.53	22 45 5.4	45 4.6	7.3454	7.429	2.68	2.87
6 15 56.2	280	5 0 11.93	0 11.21	22 45 1.4	45 0.5	7.3718	7.465	2.68	2.86
7 15 52.0	281	5 0 8.44	0 7.69	22 44 57.0	44 56.0	7.3968	7.497	2.68	2.86
8 15 48.2	282	5 0 4.74	0 3.94	22 44 52.3	44 51.2	7.4208	7.527	2.68	2.85
9 15 44.2	283	5 0 0.84	59 59.99	22 44 47.3	44 46.1	7.4438	7.555	2.67	2.85
10 15 40.2	284	4 59 56.73	59 55.83	22 44 42.0	44 40.7	7.4655	7.581	2.67	2.84
11 15 36.2	285	4 59 52.41	59 51.47	22 44 36.3	44 35.1	7.4870	7.605	2.67	2.83
12 15 32.2	286	4 59 47.89	59 46.91	22 44 30.4	44 29.1	7.5074	7.628	2.66	2.83
13 15 28.2	287	4 59 43.17	59 42.15	22 44 24.2	44 22.8	7.5268	7.650	2.66	2.82
14 15 24.2	288	4 59 38.25	59 37.19	22 44 17.7	44 16.2	7.5452	7.671	2.65	2.82
15 15 20.2	289	4 59 33.13	59 32.03	22 44 10.9	44 9.3	7.5626	7.691	2.65	2.81
16 15 16.2	290	4 59 27.80	59 26.65	22 44 3.6	44 2.1	7.5788	7.711	2.64	2.80
17 15 12.1	291	4 59 22.25	59 21.08	22 43 56.1	43 54.6	7.5939	7.730	2.64	2.80
18 15 8.1	292	4 59 16.52	59 15.32	22 43 48.4	43 46.9	7.6082	7.747	2.63	2.79
19 15 4.0	293	4 59 10.61	59 9.37	22 43 40.4	43 38.9	7.6217	7.762	2.63	2.78
20 15 0.0	294	4 59 4.52	59 3.23	22 43 32.2	43 30.6	7.6344	7.775	2.62	2.77
21 14 55.9	295	4 58 58.25	58 56.90	22 43 23.7	43 21.9	7.6464	7.786	2.61	2.76
22 14 51.9	296	4 58 51.79	58 50.40	22 43 14.9	43 13.0	7.6581	7.798	2.61	2.75
23 14 47.8	297	4 58 45.15	58 43.73	22 43 5.8	43 3.9	7.6696	7.810	2.60	2.74
24 14 43.8	298	4 58 38.34	58 36.89	22 42 56.4	42 54.5	7.6809	7.822	2.59	2.73
25 14 39.8	299	4 58 31.36	58 29.88	22 42 46.8	42 44.8	7.6920	7.834	2.58	2.72
26 14 35.8	300	4 58 24.21	58 22.68	22 42 36.9	42 34.8	7.7031	7.846	2.57	2.71
27 14 31.7	301	4 58 16.86	58 15.32	22 42 26.7	42 24.6	7.7134	7.858	2.57	2.70
28 14 27.6	302	4 58 9.35	58 7.80	22 42 16.2	42 14.1	7.7239	7.870	2.56	2.69
29 14 23.6	303	4 58 1.68	58 0.09	22 42 5.4	42 3.3	7.7325	7.881	2.55	2.68
30 14 19.5	304	4 57 53.86	57 52.20	22 41 54.3	41 52.1	7.7413	7.892	2.55	2.67
31 14 15.4	305	4 57 45.85	57 44.16	22 41 43.0	41 40.6	7.7495	7.903	2.54	2.65
32 14 11.4	306	4 57 37.69	57 35.98	+22 41 31.4	41 28.9	-7.7574	-7.913	-2.53	-2.64

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1 14 11.4	306	4 57 37.69	57 35.98	+22 41' 31.4	41' 26.9	-7.7574	-7.913	-2.53	-2.64
2 14 7.3	307	4 57 29.39	57 27.66	22 41 19.6	41 17.0	7.7650	7.923	2.52	2.63
3 14 3.2	308	4 57 20.95	57 19.20	22 41 7.6	41 4.9	7.7723	7.932	2.51	2.62
4 13 59.1	309	4 57 12.38	57 10.60	22 40 55.4	40 52.7	7.7793	7.940	2.50	2.61
5 13 55.1	310	4 57 3.67	57 1.84	22 40 42.9	40 40.3	7.7855	7.946	2.49	2.60
6 13 51.0	311	4 56 54.81	56 52.95	22 40 30.1	40 27.6	7.7920	7.954	2.47	2.59
7 13 47.0	312	4 56 45.82	56 43.94	22 40 17.1	40 14.6	7.7983	7.961	2.45	2.58
8 13 42.9	313	4 56 36.71	56 34.81	22 40 3.9	40 1.3	7.8044	7.967	2.43	2.57
9 13 38.8	314	4 56 27.47	56 25.56	22 39 50.5	39 47.8	7.8103	7.972	2.41	2.56
10 13 34.7	315	4 56 18.10	56 16.18	22 39 37.0	39 34.1	7.8161	7.979	2.39	2.55
11 13 30.6	316	4 56 8.62	56 6.69	22 39 23.2	39 20.2	7.8216	7.986	2.38	2.53
12 13 26.5	317	4 55 59.04	55 57.09	22 39 9.2	39 6.1	7.8266	7.993	2.36	2.52
13 13 22.4	318	4 55 49.36	55 47.37	22 38 55.0	38 51.8	7.8314	7.999	2.34	2.50
14 13 18.3	319	4 55 39.58	55 37.54	22 38 40.5	38 37.3	7.8361	8.005	2.32	2.49
15 13 14.2	320	4 55 29.68	55 27.62	22 38 25.8	38 22.7	7.8403	8.012	2.30	2.47
16 13 10.1	321	4 55 19.67	55 17.61	22 38 10.9	38 7.9	7.8443	8.018	2.27	2.45
17 13 6.0	322	4 55 9.58	55 7.51	22 37 55.8	37 52.9	7.8481	8.023	2.25	2.43
18 13 1.9	323	4 54 59.41	54 57.32	22 37 40.6	37 37.7	7.8517	8.027	2.23	2.41
19 12 57.8	324	4 54 49.16	54 47.04	22 37 25.3	37 22.3	7.8551	8.030	2.21	2.39
20 12 53.7	325	4 54 38.83	54 36.69	22 37 9.9	37 6.6	7.8582	8.032	2.18	-2.37
21 12 49.6	326	4 54 28.41	54 26.36	22 36 54.3	36 50.8	7.8612	8.036	2.15	
22 12 45.5	327	4 54 17.93	54 15.77	22 36 38.5	36 34.9	7.8640	8.040	2.12	
23 12 41.4	328	4 54 7.39	54 5.22	22 36 22.6	36 18.9	7.8666	8.043	2.09	
24 12 37.3	329	4 53 56.79	53 54.61	22 36 6.5	36 2.8	7.8690	8.046	2.05	
25 12 33.2	330	4 53 46.14	53 43.95	22 35 50.2	35 46.6	7.8710	8.050	-2.01	
26 12 29.1	331	4 53 35.42	53 33.23	22 35 33.8	35 30.3	7.8728	8.054		
27 12 25.0	332	4 53 24.65	53 22.47	22 35 17.3	35 13.8	7.8744	8.058		
28 12 20.9	333	4 53 13.85	53 11.67	22 35 0.7	34 57.2	7.8758	8.061		
29 12 16.8	334	4 53 3.20	53 0.83	22 34 44.0	34 40.5	7.8760	8.064		
30 12 12.6	335	4 52 52.17	52 49.96	22 34 27.3	34 23.8	7.8778	8.067		
Dec. 1 12 8.5	336	4 52 41.29	52 39.07	22 34 10.5	34 6.9	7.8787	8.070		
2 12 4.4	337	4 52 30.37	52 28.16	22 33 53.5	33 49.9	7.8794	8.073		
3 12 0.3	338	4 52 19.43	52 17.24	22 33 36.4	33 32.8	7.8798	8.075		
4 11 56.2	339	4 52 8.50	52 6.31	22 33 19.2	33 15.6	7.8800	8.077		
5 11 52.1	340	4 51 57.57	51 55.36	22 33 1.9	32 58.3	7.8802	8.080		
6 11 48.0	341	4 51 46.64	51 44.42	22 32 44.6	32 41.0	7.8801	8.081		
7 11 43.9	342	4 51 35.71	51 43.49	22 32 27.3	32 23.7	7.8800	8.082	+2.00	
8 11 39.8	343	4 51 24.78	51 42.57	22 32 10.0	32 6.4	7.8798	8.082	2.04	
9 11 35.7	344	4 51 13.85	51 31.65	22 31 52.7	31 49.1	7.8795	8.082	2.08	
10 11 31.5	345	4 51 2.94	51 0.74	22 31 35.4	31 31.8	7.8790	8.082	2.11	
11 11 27.4	346	4 50 52.06	50 49.87	22 31 18.0	31 14.5	7.8783	8.082	2.13	
12 11 23.3	347	4 50 41.22	50 39.04	22 31 0.6	30 57.1	7.8773	8.082	2.15	
13 11 19.2	348	4 50 30.42	50 28.25	22 30 43.2	30 39.7	7.8758	8.081	2.17	
14 11 15.1	349	4 50 19.66	50 17.50	22 30 25.8	30 22.3	7.8738	8.081	2.19	
15 11 11.0	350	4 50 8.93	50 6.77	22 30 8.5	30 5.0	7.8714	8.080	2.21	
16 11 6.9	351	4 49 58.23	49 56.09	22 29 51.2	29 47.7	7.8692	8.078	2.23	
17 11 2.8	352	4 49 47.59	49 45.47	22 29 33.9	29 30.5	7.8669	8.076	2.24	
18 10 58.7	353	4 49 37.01	49 34.91	22 29 16.7	29 13.3	7.8645	8.074	2.25	
19 10 54.6	354	4 49 26.49	49 24.40	22 28 59.6	28 56.2	7.8620	8.072	2.27	
20 10 50.5	355	4 49 16.04	49 13.95	22 28 42.7	28 39.2	7.8594	8.069	2.28	+2.37
21 10 46.4	356	4 49 5.66	49 3.57	22 28 25.8	28 22.3	7.8563	8.066	2.29	2.40
22 10 42.2	357	4 48 55.36	48 53.28	22 28 8.9	28 5.4	7.8530	8.063	2.31	2.42
23 10 38.1	358	4 48 45.15	48 43.08	22 27 52.1	27 48.6	7.8495	8.060	2.33	2.45
24 10 34.0	359	4 48 35.03	48 32.97	22 27 35.4	27 31.9	7.8458	8.057	2.35	2.47
25 10 29.9	360	4 48 24.98	48 22.96	22 27 18.8	27 15.4	7.8420	8.054	2.36	2.49
26 10 25.8	361	4 48 15.01	48 13.02	22 27 2.3	26 59.0	7.8378	8.051	2.37	2.51
27 10 21.7	362	4 48 5.14	48 3.18	22 26 45.9	26 42.7	7.8334	8.048	2.39	2.53
28 10 17.6	363	4 47 55.37	47 53.43	22 26 29.7	26 26.5	7.8288	8.045	2.40	2.55
29 10 13.5	364	4 47 45.70	47 43.78	22 26 13.7	26 10.5	7.8240	8.042	2.42	2.57
30 10 9.4	365	4 47 36.15	47 34.27	22 25 57.9	25 54.6	7.8193	8.038	2.43	2.59
31 10 5.3	366	4 47 26.73	47 24.89	+22 25 42.3	25 38.8	-7.8146	-8.033	+2.44	+2.60

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.																			
Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .									
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.								
Jan.	d	h	m	d	h	m	s	m	s	-	0	29	50.9	29	51.0	+7.3173	+8.181	+2.45	+3.27
	1	5	4.1	1	23	50	15.78	50	15.76	2	29	28.7	29	28.9	7.3344	8.196	2.45	3.27	
	2	5	0.3	2	23	50	18.83	50	18.81	2	29	5.6	29	5.8	7.3508	8.210	2.44	3.26	
	3	4	56.4	3	23	50	21.99	50	21.97	2	28	41.9	28	42.1	7.3666	8.223	2.44	3.25	
	4	4	52.6	4	23	50	25.28	50	25.26	2	28	17.4	28	17.6	7.3819	8.237	2.43	3.24	
	5	4	48.7	5	23	50	32.23	50	32.21	2	27	52.2	27	52.4	7.3967	8.250	2.42	3.23	
	6	4	44.8	6	23	50	35.88	50	35.86	2	27	26.2	27	26.4	7.4104	8.263	2.42	3.22	
	7	4	40.9	7	23	50	39.64	50	39.62	2	26	59.4	26	59.6	7.4231	8.275	2.41	3.21	
	8	4	37.1	8	23	50	43.51	50	43.48	2	26	31.9	26	32.1	7.4360	8.286	2.41	3.20	
	9	4	33.2	9	23	50	47.50	50	47.47	2	26	3.7	26	3.9	7.4491	8.297	2.40	3.20	
	10	4	29.4	10	23	50	51.61	50	51.58	2	25	34.8	25	35.0	7.4612	8.308	2.40	3.19	
	11	4	25.5	11	23	50	55.83	50	55.80	2	25	5.1	25	5.3	7.4730	8.319	2.39	3.18	
	12	4	21.7	12	23	51	0.17	51	0.14	2	24	34.7	24	34.9	7.4836	8.329	2.39	3.18	
	13	4	17.8	13	23	51	4.62	51	4.59	2	24	3.6	24	3.8	7.4940	8.339	2.38	3.17	
	14	4	14.0	14	23	51	9.17	51	9.14	2	23	31.8	23	32.0	7.5044	8.348	2.37	3.16	
	15	4	10.1	15	23	51	13.82	51	13.79	2	22	59.4	22	59.6	7.5146	8.357	2.36	3.15	
	16	4	6.3	16	23	51	18.59	51	18.56	2	22	26.3	22	26.5	7.5250	8.366	2.36	3.15	
	17	4	2.4	17	23	51	23.47	51	23.44	2	21	52.5	21	52.7	7.5344	8.374	2.35	3.14	
	18	3	58.6	18	23	51	28.45	51	28.42	2	21	18.1	21	18.3	7.5432	8.382	2.35	3.13	
	19	3	54.7	19	23	51	33.53	51	33.50	2	20	43.0	20	43.2	7.5517	8.390	2.34	3.12	
	20	3	50.9	20	23	51	38.71	51	38.68	2	20	7.4	20	7.6	7.5601	8.398	2.34	3.12	
	21	3	47.0	21	23	51	43.99	51	43.96	2	19	31.1	19	31.3	7.5693	8.405	2.33	3.11	
	22	3	43.2	22	23	51	49.37	51	49.34	2	18	54.2	18	54.4	7.5768	8.412	2.32	3.10	
	23	3	39.3	23	23	51	54.86	51	54.83	2	18	16.7	18	16.9	7.5847	8.419	2.31	3.09	
	24	3	35.5	24	23	52	0.44	52	0.41	2	17	38.6	17	38.8	7.5917	8.426	2.31	3.09	
	25	3	31.7	25	23	52	6.11	52	6.08	2	16	59.9	17	0.1	7.5986	8.433	2.30	3.08	
	26	3	27.8	26	23	52	11.87	52	11.84	2	16	20.6	16	20.8	7.6054	8.439	2.29	3.07	
	27	3	24.0	27	23	52	17.72	52	17.69	2	15	40.7	15	40.9	7.6121	8.445	2.28	3.06	
	28	3	20.2	28	23	52	23.66	52	23.63	2	15	0.3	15	0.5	7.6187	8.451	2.27	3.05	
	29	3	16.3	29	23	52	29.69	52	29.66	2	14	19.3	14	19.5	7.6252	8.457	2.26	3.04	
	30	3	12.5	30	23	52	35.81	52	35.78	2	13	37.8	13	38.0	7.6316	8.462	2.25	3.03	
	31	3	8.7	31	23	52	42.02	52	41.99	2	12	55.8	12	56.0	7.6375	8.467	2.24	3.02	
Feb.	1	3	4.9	32	23	52	48.31	52	48.28	2	12	13.3	12	13.5	7.6433	8.472	2.23	3.01	
	2	3	1.1	33	23	52	54.69	52	54.66	2	11	30.3	11	30.5	7.6491	8.477	2.22	3.00	
	3	2	57.2	34	23	53	1.15	53	1.12	2	10	46.8	10	47.0	7.6548	8.482	2.21	2.99	
	4	2	53.4	35	23	53	7.70	53	7.67	2	10	2.7	10	2.9	7.6605	8.487	2.20	2.97	
	5	2	49.6	36	23	53	14.33	53	14.30	2	9	18.2	9	18.4	7.6654	8.492	2.19	2.96	
	6	2	45.7	37	23	53	21.03	53	21.00	2	8	33.2	8	33.4	7.6703	8.497	2.18	2.95	
	7	2	41.9	38	23	53	27.81	53	27.78	2	7	47.8	7	48.0	7.6750	8.501	2.17	2.94	
	8	2	38.1	39	23	53	34.66	53	34.63	2	7	1.9	7	2.1	7.6798	8.505	2.16	2.92	
	9	2	34.3	40	23	53	41.59	53	41.56	2	6	15.6	6	15.8	7.6845	8.509	2.15	2.91	
	10	2	30.5	41	23	53	48.59	53	48.56	2	5	28.9	5	29.1	7.6886	8.513	2.14	2.89	
	11	2	26.6	42	22	53	55.65	53	55.62	2	4	41.8	4	42.0	7.6925	8.517	2.12	2.87	
	12	2	22.8	43	23	54	2.78	54	2.75	2	3	54.2	3	54.4	7.6965	8.520	2.10	2.85	
	13	2	19.0	44	23	54	9.97	54	9.94	2	3	6.3	3	6.5	7.7004	8.524	2.09	2.83	
	14	2	15.2	45	23	54	17.23	54	17.20	2	2	18.0	2	18.1	7.7043	8.527	2.07	2.81	
	15	2	11.4	46	23	54	24.55	54	24.53	2	1	29.3	1	29.4	7.7079	8.530	2.05	2.79	
	16	2	7.6	47	23	54	31.93	54	31.91	2	0	40.3	0	40.4	7.7114	8.533	2.03	2.77	
	17	2	3.8	48	23	54	39.37	54	39.35	1	59	51.0	59	51.1	7.7146	8.536	2.01	2.75	
	18	2	0.0	49	23	54	46.86	54	46.84	1	59	1.3	59	1.4	7.7178	8.539	1.99	2.73	
	19	1	56.1	50	23	54	54.41	54	54.39	1	58	11.3	58	11.4	7.7210	8.542	1.97	2.71	
	20	1	52.3	51	23	55	2.01	55	1.99	1	57	21.0	57	21.1	7.7239	8.544	1.95	+2.67	
	21	1	48.5	52	23	55	9.66	55	9.64	1	56	30.4	56	30.5	7.7267	8.547	1.93		
	22	1	44.7	53	23	55	17.36	55	17.34	1	55	39.6	55	39.7	7.7295	8.549	1.91		
	23	1	40.9	54	23	55	25.10	55	25.08	1	54	48.5	54	48.6	7.7323	8.551	1.88		
	24	1	37.1	55	23	55	32.90	55	32.88	1	53	57.1	53	57.2	7.7348	8.553	1.85		
	25	1	33.3	56	23	55	40.74	55	40.72	1	53	5.5	53	5.6	7.7370	8.555	1.83		
	26	1	29.5	57	23	55	48.62	55	48.60	1	52	13.7	52	13.8	7.7392	8.557	1.80		
	27	1	25.7	58	23	55	56.54	55	56.52	1	51	21.6	51	21.7	7.7414	8.559	1.77		
	28	1	21.9	59	23	56	4.50	56	4.48	1	50	29.3	50	29.4	7.7436	8.561	+1.73		
	29	1	18.1	60	23	56	12.50	56	12.48	1	49	36.8	49	36.9	7.7455	8.562			
	30	1	14.3	61	23	56	20.53	56	20.51	-	1	48	44.2	48	44.3	+7.7472	+8.563		

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 1 18.1	60	23 56 12.50	56 12.48	- 1° 49' 36.8	49 36.9	+7.7455	+8.562		
2 1 14.3	61	23 56 20.53	56 20.51	1 48 44.2	48 44.3	7.7472	8.563		
3 1 10.5	62	23 56 28.59	56 28.57	1 47 51.4	47 51.5	7.7488	8.565		
4 1 6.7	63	23 56 36.68	56 36.66	1 46 58.4	46 58.5	7.7504	8.566		
5 1 2.9	64	23 56 44.80	56 44.78	1 46 5.3	46 5.3	7.7520	8.567		
6 0 59.1	65	23 56 52.95	56 52.93	1 45 12.1	45 12.1	7.7536	8.568		
7 0 55.3	66	23 57 1.13	57 1.11	1 44 18.7	44 18.7	7.7552	8.569		
8 0 51.5	67	23 57 9.34	57 9.32	1 43 25.2	43 25.2	7.7565	8.570		
9 0 47.7	68	23 57 17.57	57 17.55	1 42 31.7	42 31.7	7.7575	8.571		
10 0 43.9	69	23 57 25.82	57 25.80	1 41 38.1	41 38.1	7.7584	8.572		
11 0 40.1	70	23 57 34.08	57 34.06	1 40 44.4	40 44.4	7.7593	8.573		
12 0 36.3	71	23 57 42.36	57 42.34	1 39 50.6	39 50.6	7.7602	8.573		
13 0 32.5	72	23 57 50.66	57 50.64	1 38 56.7	38 56.7	7.7610	8.573		
14 0 28.7	73	23 57 58.97	57 58.95	1 38 2.8	38 2.8	7.7612	8.573		
15 0 24.9	74	23 58 7.28	58 7.27	1 37 8.9	37 8.9	7.7615	8.574		
16 0 21.1	75	23 58 15.60	58 15.59	1 36 14.9	36 14.9	7.7617	8.574		
17 0 17.3	76	23 58 23.92	58 23.91	1 35 20.9	35 20.9	7.7620	8.573		
18 0 13.5	77	23 58 32.25	58 32.24	1 34 27.0	34 27.0	7.7624	8.573		
19 0 9.7	78	23 58 40.59	58 40.58	1 33 33.1	33 33.1	7.7628	8.573		
20 0 5.9	79	23 58 48.93	58 48.92	1 32 39.3	32 39.3	7.7631	8.572		
21 0 2.1	80	23 58 57.28	58 57.27	1 31 45.5	31 45.5	7.7631	8.572		
21 23 58.3	81	23 59 5.62	59 5.61	1 30 51.8	30 51.8	7.7625	8.571		
22 23 54.5	82	23 59 13.95	59 13.94	1 29 58.2	29 58.2	7.7620	8.570		
23 23 50.7	83	23 59 22.27	59 22.26	1 29 4.7	29 4.7	7.7617	8.570		
24 23 47.0	84	23 59 30.59	59 30.58	1 28 11.2	28 11.2	7.7612	8.569	-1.73	-2.70
25 23 43.2	85	23 59 38.89	59 38.88	1 27 17.8	27 17.8	7.7605	8.568	1.77	2.73
26 23 39.4	86	23 59 47.18	59 47.17	1 26 24.6	26 24.6	7.7599	8.567	1.80	2.75
27 23 35.6	87	23 59 55.46	59 55.46	1 25 31.5	25 31.5	7.7591	8.566	1.82	2.77
28 23 31.8	88	0 0 3.72	0 3.72	1 24 38.5	24 38.5	7.7584	8.565	1.84	2.78
29 23 28.0	89	0 0 11.97	0 11.97	1 23 45.7	23 45.7	7.7575	8.564	1.87	2.80
30 23 24.2	90	0 0 20.20	0 20.20	1 22 53.1	22 53.1	7.7565	8.562	1.89	2.82
31 23 20.4	91	0 0 28.41	0 28.41	1 22 0.6	22 0.6	7.7552	8.561	1.92	2.84
Apr. 1 23 16.6	92	0 0 36.59	0 36.59	1 21 8.3	21 8.3	7.7538	8.559	1.94	2.85
2 23 12.8	93	0 0 44.75	0 44.75	1 20 16.2	20 16.2	7.7525	8.557	1.97	2.87
3 23 9.0	94	0 0 52.88	0 52.88	1 19 24.4	19 24.4	7.7512	8.555	1.99	2.89
4 23 5.2	95	0 1 0.98	1 0.98	1 18 32.8	18 32.8	7.7498	8.553	2.01	2.90
5 23 1.4	96	0 1 9.07	1 9.07	1 17 41.4	17 41.4	7.7484	8.551	2.03	2.91
6 22 57.6	97	0 1 17.13	1 17.13	1 16 50.3	16 50.3	7.7469	8.549	2.05	2.93
7 22 53.8	98	0 1 25.15	1 25.15	1 15 59.4	15 59.4	7.7444	8.547	2.07	2.94
8 22 50.0	99	0 1 33.13	1 33.13	1 15 8.8	15 8.8	7.7428	8.545	2.09	2.95
9 22 46.2	100	0 1 41.08	1 41.08	1 14 18.5	14 18.5	7.7409	8.543	2.10	2.96
10 22 42.4	101	0 1 48.99	1 49.00	1 13 28.5	13 28.5	7.7387	8.540	2.12	2.97
11 22 38.6	102	0 1 56.86	1 56.87	1 12 38.8	12 38.8	7.7364	8.537	2.13	2.98
12 22 34.8	103	0 2 4.68	2 4.69	1 11 49.4	11 49.4	7.7340	8.534	2.14	2.99
13 22 31.0	104	0 2 12.46	2 12.47	1 11 0.3	11 0.3	7.7315	8.531	2.15	3.00
14 22 27.2	105	0 2 20.20	2 20.21	1 10 11.5	10 11.5	7.7290	8.528	2.16	3.01
15 22 23.4	106	0 2 27.89	2 27.90	1 9 23.1	9 23.1	7.7262	8.525	2.17	3.02
16 22 19.6	107	0 2 35.53	2 35.54	1 8 35.1	8 35.0	7.7233	8.522	2.18	3.03
17 22 15.8	108	0 2 43.12	2 43.13	1 7 47.5	7 47.4	7.7204	8.519	2.19	3.04
18 22 12.0	109	0 2 50.66	2 50.67	1 7 0.2	7 0.1	7.7172	8.515	2.20	3.05
19 22 8.2	110	0 2 58.14	2 58.15	1 6 13.3	6 13.2	7.7141	8.511	2.21	3.06
20 22 4.4	111	0 3 5.57	3 5.58	1 5 26.8	5 26.7	7.7108	8.507	2.22	3.07
21 22 0.6	112	0 3 12.94	3 12.95	1 4 40.7	4 40.6	7.7073	8.503	2.23	3.08
22 21 56.8	113	0 3 20.25	3 20.26	1 3 55.1	3 55.0	7.7037	8.499	2.24	3.09
23 21 53.0	114	0 3 27.50	3 27.51	1 3 9.9	3 9.8	7.7001	8.495	2.25	3.10
24 21 49.2	115	0 3 34.69	3 34.70	1 2 25.1	2 25.0	7.6965	8.491	2.26	3.11
25 21 45.4	116	0 3 41.83	3 41.84	1 1 40.8	1 40.7	7.6928	8.487	2.27	3.11
26 21 41.6	117	0 3 48.90	3 48.91	1 0 56.9	0 56.8	7.6889	8.482	2.28	3.12
27 21 37.8	118	0 3 55.90	3 55.91	1 0 13.5	0 13.4	7.6847	8.477	2.29	3.13
28 21 34.0	119	0 4 2.83	4 2.85	0 59 30.6	59 30.5	7.6805	8.472	2.30	3.14
29 21 30.1	120	0 4 9.70	4 9.72	0 58 48.1	58 48.0	7.6763	8.467	2.30	3.14
30 21 26.3	121	0 4 16.50	4 16.52	- 0 58 6.1	58 6.0	+7.6718	+8.462	-2.31	-3.15

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
May	d h m	d h m s	m s	° ' "	° ' "				
1 21 22.5	122	0 4 23.23	4 23.25	- 0 57 24.6	57 24.5	+7.6673	+8.456	-2.32	-3.15
2 21 18.7	123	0 4 29.89	4 29.91	0 56 43.7	56 43.6	7.6625	8.451	2.33	3.16
3 21 14.9	124	0 4 36.46	4 36.48	0 56 3.2	56 3.1	7.6572	8.446	2.33	3.16
4 21 11.1	125	0 4 42.96	4 42.98	0 55 23.2	55 23.1	7.6518	8.440	2.34	3.17
5 21 7.3	126	0 4 49.38	4 49.40	0 54 43.8	54 43.7	7.6467	8.434	2.34	3.17
6 21 3.5	127	0 4 55.73	4 55.75	0 54 5.0	54 4.9	7.6416	8.428	2.35	3.18
7 20 59.6	128	0 5 2.00	5 2.02	0 53 26.7	53 26.6	7.6361	8.422	2.35	3.18
8 20 55.8	129	0 5 8.19	5 8.21	0 52 49.0	52 48.9	7.6302	8.415	2.36	3.19
9 20 52.0	130	0 5 14.29	5 14.31	0 52 11.9	52 11.8	7.6241	8.408	2.36	3.19
10 20 48.1	131	0 5 20.30	5 20.32	0 51 35.3	51 35.2	7.6180	8.401	2.37	3.20
11 20 44.3	132	0 5 26.24	5 26.26	0 50 59.3	50 59.2	7.6114	8.394	2.37	3.20
12 20 40.5	133	0 5 32.08	5 32.10	0 50 23.9	50 23.8	7.6047	8.387	2.38	3.21
13 20 36.6	134	0 5 37.83	5 37.85	0 49 49.1	49 49.0	7.5982	8.379	2.38	3.21
14 20 32.8	135	0 5 43.50	5 43.52	0 49 14.9	49 14.8	7.5921	8.371	2.39	3.22
15 20 28.9	136	0 5 49.09	5 49.11	0 48 41.4	48 41.3	7.5861	8.363	2.39	3.22
16 20 25.1	137	0 5 54.58	5 54.60	0 48 8.5	48 8.4	7.5775	8.355	2.40	3.22
17 20 21.2	138	0 5 59.97	5 59.99	0 47 36.2	47 36.1	7.5695	8.346	2.40	3.23
18 20 17.4	139	0 6 5.27	6 5.29	0 47 4.6	47 4.5	7.5622	8.337	2.41	3.23
19 20 13.5	140	0 6 10.48	6 10.50	0 46 33.6	46 33.5	7.5542	8.328	2.41	3.23
20 20 9.7	141	0 6 15.59	6 15.61	0 46 3.2	46 3.1	7.5458	8.319	2.41	3.24
21 20 5.8	142	0 6 20.60	6 20.62	0 45 33.5	45 33.4	7.5371	8.309	2.42	3.24
22 20 2.0	143	0 6 25.51	6 25.53	0 45 4.5	45 4.4	7.5286	8.299	2.42	3.24
23 19 58.1	144	0 6 30.33	6 30.35	0 44 36.1	44 36.0	7.5201	8.289	2.42	3.24
24 19 54.3	145	0 6 35.05	6 35.07	0 44 8.4	44 8.3	7.5109	8.278	2.42	3.25
25 19 50.4	146	0 6 39.67	6 39.69	0 43 41.4	43 41.3	7.5015	8.267	2.43	3.25
26 19 46.6	147	0 6 44.19	6 44.21	0 43 15.1	43 15.0	7.4914	8.256	2.43	3.25
27 19 42.7	148	0 6 48.60	6 48.62	0 42 49.5	42 49.4	7.4811	8.244	2.43	3.25
28 19 38.8	149	0 6 52.91	6 52.93	0 42 24.6	42 24.5	7.4708	8.232	2.43	3.25
29 19 35.0	150	0 6 57.12	6 57.14	0 42 0.4	42 0.3	7.4601	8.219	2.43	3.25
30 19 31.1	151	0 7 1.22	7 1.24	0 41 36.9	41 36.8	7.4491	8.205	2.44	3.25
31 19 27.2	152	0 7 5.22	7 5.24	0 41 14.2	41 14.1	7.4380	8.192	2.44	3.25
June 1 19 23.4	153	0 7 9.12	7 9.14	0 40 52.1	40 52.0	7.4265	8.178	2.44	3.25
2 19 19.5	154	0 7 12.91	7 12.92	0 40 30.8	40 30.7	7.4133	8.163	2.44	3.26
3 19 15.6	155	0 7 16.58	7 16.60	0 40 10.2	40 10.1	7.3997	8.148	2.44	3.26
4 19 11.8	156	0 7 20.13	7 20.15	0 39 50.3	39 50.2	7.3863	8.133	2.44	3.26
5 19 7.9	157	0 7 23.58	7 23.60	0 39 31.1	39 31.0	7.3724	8.116	2.44	3.26
6 19 4.0	158	0 7 26.92	7 26.94	0 39 12.7	39 12.6	7.3575	8.098	2.45	3.26
7 19 0.1	159	0 7 30.14	7 30.16	0 38 55.0	38 54.9	7.3413	8.080	2.45	3.26
8 18 56.2	160	0 7 33.24	7 33.26	0 38 38.1	38 38.0	7.3252	8.060	2.45	3.26
9 18 52.4	161	0 7 36.23	7 36.25	0 38 21.9	38 21.8	7.3092	8.040	2.45	3.26
10 18 48.5	162	0 7 39.11	7 39.13	0 38 6.5	38 6.4	7.2926	8.019	2.45	3.27
11 18 44.6	163	0 7 41.87	7 41.89	0 37 51.8	37 51.7	7.2754	7.997	2.45	3.27
12 18 40.7	164	0 7 44.53	7 44.55	0 37 37.9	37 37.8	7.2566	7.972	2.45	3.27
13 18 36.8	165	0 7 47.07	7 47.08	0 37 24.8	37 24.7	7.2361	7.947	2.45	3.27
14 18 32.9	166	0 7 49.49	7 49.50	0 37 12.4	37 12.3	7.2154	7.921	2.46	3.27
15 18 29.0	167	0 7 51.80	7 51.81	0 37 0.8	37 0.8	7.1938	7.891	2.46	3.27
16 18 25.1	168	0 7 53.99	7 54.00	0 36 50.0	36 50.0	7.1710	7.861	2.46	3.27
17 18 21.2	169	0 7 56.07	7 56.08	0 36 39.9	36 39.9	7.1470	7.828	2.46	3.27
18 18 17.3	170	0 7 58.03	7 58.04	0 36 30.6	36 30.6	7.1204	7.792	2.46	3.27
19 18 13.4	171	0 7 59.87	7 59.88	0 36 22.1	36 22.1	7.0920	7.753	2.46	3.27
20 18 9.5	172	0 8 1.59	8 1.60	0 36 14.3	36 14.3	7.0630	7.711	2.46	3.27
21 18 5.6	173	0 8 3.20	8 3.21	0 36 7.3	36 7.3	7.0319	7.661	2.46	3.27
22 18 1.7	174	0 8 4.69	8 4.70	0 36 1.1	36 1.1	6.9969	7.605	2.46	3.27
23 17 57.8	175	0 8 6.06	8 6.07	0 35 55.7	35 55.7	6.9589	7.545	2.46	3.27
24 17 53.9	176	0 8 7.30	8 7.31	0 35 51.0	35 51.0	6.9171	7.475	2.46	3.27
25 17 50.0	177	0 8 8.43	8 8.44	0 35 47.1	35 47.1	6.8711	7.396	2.46	3.27
26 17 46.1	178	0 8 9.44	8 9.45	0 35 44.0	35 44.0	6.8193	7.273	2.46	3.26
27 17 42.1	179	0 8 10.33	8 10.33	0 35 41.7	35 41.7	6.7607	7.132	2.46	3.26
28 17 38.2	180	0 8 11.11	8 11.11	0 35 40.1	35 40.1	6.6929	6.921	2.46	3.26
29 17 34.3	181	0 8 11.77	8 11.77	0 35 39.3	35 39.3	6.6125	+6.444	2.46	3.26
30 17 30.4	182	0 8 12.31	8 12.31	0 35 39.3	35 39.3	6.5137	-6.444	2.46	3.26
31 17 26.5	183	0 8 12.73	8 12.73	- 0 35 40.1	35 40.1	+6.3557	-6.921	-2.46	-3.25

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d h m	d h m s	m s	° ' "	° ' "				
1 17 26.5	183	0 8 12.73	8 12.73	- 0 35 40.1	35 40.1	+6.3857	-6.921	-2.45	-3.26
2 17 22.5	184	0 8 13.02	8 13.02	0 35 41.6	35 41.6	6.2127	7.132	2.45	3.25
3 17 18.6	185	0 8 13.20	8 13.20	0 35 43.9	35 43.9	+5.9208	7.273	2.45	3.25
4 17 14.6	186	0 8 13.26	8 13.26	0 35 47.0	35 47.0	-Inf.	7.386	2.45	3.24
5 17 10.7	187	0 8 13.20	8 13.20	0 35 50.9	35 50.9	-5.9208	7.470	2.44	3.24
6 17 6.8	188	0 8 13.02	8 13.02	0 35 55.5	35 55.5	6.2218	7.541	2.44	3.24
7 17 2.8	189	0 8 12.72	8 12.72	0 36 0.9	36 0.9	6.3079	7.601	2.44	3.24
8 16 58.9	190	0 8 12.30	8 12.30	0 36 7.0	36 7.0	6.5228	7.654	2.44	3.24
9 16 55.0	191	0 8 11.76	8 11.76	0 36 13.9	36 13.9	6.6198	7.705	2.43	3.23
10 16 51.0	192	0 8 11.11	8 11.11	0 36 21.6	36 21.6	6.6969	7.747	2.43	3.23
11 16 47.1	193	0 8 10.33	8 10.33	0 36 30.0	36 30.0	6.7633	7.786	2.43	3.23
12 16 43.1	194	0 8 9.44	8 9.43	0 36 39.2	36 39.2	6.8193	7.822	2.43	3.23
13 16 39.2	195	0 8 8.43	8 8.42	0 36 49.1	36 49.1	6.8690	7.854	2.42	3.22
14 16 35.2	196	0 8 7.31	8 7.30	0 36 59.8	36 59.8	6.9117	7.885	2.42	3.22
15 16 31.3	197	0 8 6.08	8 6.07	0 37 11.2	37 11.2	6.9522	7.912	2.42	3.22
16 16 27.3	198	0 8 4.73	8 4.72	0 37 23.3	37 23.3	6.9908	7.937	2.42	3.21
17 16 23.4	199	0 8 3.26	8 3.25	0 37 36.1	37 36.2	7.0248	7.962	2.41	3.21
18 16 19.4	200	0 8 1.68	8 1.67	0 37 49.7	37 49.9	7.0551	7.986	2.41	3.20
19 16 15.5	201	0 7 59.99	7 59.98	0 38 4.0	38 4.1	7.0846	8.007	2.41	3.20
20 16 11.5	202	0 7 58.18	7 58.17	0 38 19.0	38 19.1	7.1123	8.028	2.40	3.19
21 16 7.5	203	0 7 56.26	7 56.25	0 38 34.7	38 34.8	7.1372	8.047	2.40	3.19
22 16 3.6	204	0 7 54.23	7 54.22	0 38 51.0	38 51.1	7.1608	8.065	2.39	3.18
23 15 59.6	205	0 7 52.09	7 52.08	0 39 8.1	39 8.2	7.1830	8.083	2.39	3.18
24 15 55.6	206	0 7 49.84	7 49.83	0 39 25.9	39 26.0	7.2042	8.099	2.38	3.17
25 15 51.7	207	0 7 47.49	7 47.48	0 39 44.3	39 44.4	7.2245	8.115	2.38	3.17
26 15 47.7	208	0 7 45.02	7 45.01	0 40 3.5	40 3.6	7.2430	8.131	2.37	3.16
27 15 43.7	209	0 7 42.45	7 42.44	0 40 23.3	40 23.4	7.2607	8.146	2.37	3.16
28 15 39.7	210	0 7 39.77	7 39.76	0 40 43.8	40 43.9	7.2778	8.160	2.36	3.15
29 15 35.8	211	0 7 36.99	7 36.98	0 41 4.9	41 5.0	7.2934	8.174	2.36	3.14
30 15 31.8	212	0 7 34.11	7 34.10	0 41 26.7	41 26.8	7.3092	8.187	2.35	3.13
31 15 27.8	213	0 7 31.12	7 31.11	0 41 49.2	41 49.3	7.3245	8.200	2.35	3.13
Aug. 1 15 23.8	214	0 7 28.03	7 28.02	0 42 12.3	42 12.4	7.3385	8.211	2.34	3.12
2 15 19.8	215	0 7 24.84	7 24.83	0 42 36.0	42 36.1	7.3521	8.222	2.33	3.11
3 15 15.8	216	0 7 21.55	7 21.54	0 43 0.2	43 0.3	7.3653	8.233	2.32	3.10
4 15 11.8	217	0 7 18.16	7 18.15	0 43 25.1	43 25.2	7.3782	8.243	2.32	3.09
5 15 7.8	218	0 7 14.67	7 14.66	0 43 50.6	43 50.7	7.3906	8.253	2.31	3.08
6 15 3.8	219	0 7 11.09	7 11.07	0 44 16.7	44 16.8	7.4021	8.263	2.30	3.07
7 14 59.8	220	0 7 7.41	7 7.39	0 44 43.4	44 43.5	7.4127	8.272	2.29	3.06
8 14 55.8	221	0 7 3.64	7 3.62	0 45 10.7	45 10.8	7.4231	8.281	2.28	3.05
9 14 51.8	222	0 6 59.78	6 59.76	0 45 38.5	45 38.6	7.4332	8.289	2.27	3.04
10 14 47.8	223	0 6 55.83	6 55.81	0 46 6.8	46 6.9	7.4431	8.297	2.26	3.03
11 14 43.8	224	0 6 51.79	6 51.77	0 46 35.7	46 35.8	7.4528	8.305	2.25	3.02
12 14 39.8	225	0 6 47.66	6 47.64	0 47 5.1	47 5.2	7.4617	8.313	2.24	3.01
13 14 35.8	226	0 6 43.45	6 43.43	0 47 35.0	47 35.1	7.4700	8.321	2.23	3.00
14 14 31.8	227	0 6 39.16	6 39.14	0 48 5.4	48 5.5	7.4781	8.328	2.22	2.99
15 14 27.8	228	0 6 34.78	6 34.76	0 48 36.4	48 36.5	7.4860	8.335	2.20	2.97
16 14 23.8	229	0 6 30.33	6 30.31	0 49 7.8	49 7.9	7.4938	8.342	2.19	2.96
17 14 19.8	230	0 6 25.79	6 25.77	0 49 39.7	49 39.8	7.5015	8.348	2.17	2.95
18 14 15.8	231	0 6 21.17	6 21.15	0 50 12.0	50 12.1	7.5091	8.354	2.16	2.93
19 14 11.8	232	0 6 16.48	6 16.46	0 50 44.8	50 44.9	7.5165	8.360	2.14	2.91
20 14 7.8	233	0 6 11.71	6 11.69	0 51 18.0	51 18.1	7.5232	8.366	2.13	2.90
21 14 3.8	234	0 6 6.87	6 6.85	0 51 51.6	51 51.7	7.5295	8.371	2.11	2.88
22 13 59.8	235	0 6 1.96	6 1.94	0 52 25.7	52 25.8	7.5357	8.376	2.09	2.86
23 13 55.7	236	0 5 56.98	5 56.96	0 53 0.2	53 0.3	7.5418	8.381	2.07	2.84
24 13 51.7	237	0 5 51.93	5 51.91	0 53 35.1	53 35.2	7.5479	8.386	2.06	2.82
25 13 47.7	238	0 5 46.81	5 46.79	0 54 10.4	54 10.5	7.5534	8.391	2.04	2.80
26 13 43.7	239	0 5 41.63	5 41.61	0 54 46.0	54 46.1	7.5584	8.395	2.02	2.78
27 13 39.7	240	0 5 36.39	5 36.37	0 55 22.0	55 22.1	7.5634	8.399	2.00	2.75
28 13 35.7	241	0 5 31.09	5 31.07	0 55 58.3	55 58.4	7.5683	8.403	1.98	2.72
29 13 31.7	242	0 5 25.73	5 25.71	0 56 34.9	56 35.0	7.5728	8.407	1.96	-2.67
30 13 27.6	243	0 5 20.32	5 20.30	0 57 11.8	57 11.9	7.5768	8.411	1.94	
31 13 23.6	244	0 5 14.86	5 14.84	- 0 57 49.1	57 49.2	-7.5808	-8.415	-1.91	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
Sept. d h m	d	h m s	m s	° ' "	° ' "						
1 13 19.6	245	0 5 9.35	5 9.33	-0 58 26.7	58 26.8	-7.5847	-8.418	-1.88			
2 13 15.6	246	0 5 3.79	5 3.77	0 59 4.5	59 4.6	7.5886	8.421	1.85			
3 13 11.5	247	0 4 58.18	4 58.16	0 59 42.6	59 42.7	7.5925	8.424	1.81			
4 13 7.5	248	0 4 52.52	4 52.50	1 0 20.9	0 21.0	7.5959	8.427	1.77			
5 13 3.5	249	0 4 46.82	4 46.80	1 0 59.5	0 59.6	7.5990	8.429	-1.72			
6 12 59.5	250	0 4 41.08	4 41.06	1 1 38.3	1 38.4	7.6020	8.431				
7 12 55.4	251	0 4 35.31	4 35.29	1 2 17.2	2 17.3	7.6050	8.433				
8 12 51.4	252	0 4 29.50	4 29.48	1 2 56.3	2 56.4	7.6077	8.435				
9 12 47.4	253	0 4 23.65	4 23.63	1 3 35.6	3 35.7	7.6099	8.436				
10 12 43.4	254	0 4 17.77	4 17.75	1 4 15.0	4 15.1	7.6121	8.438				
11 12 39.3	255	0 4 11.86	4 11.85	1 4 54.6	4 54.7	7.6143	8.440				
12 12 35.3	256	0 4 5.92	4 5.91	1 5 34.3	5 34.4	7.6165	8.441				
13 12 31.3	257	0 3 59.96	3 59.95	1 6 14.1	6 14.2	7.6183	8.442				
14 12 27.3	258	0 3 53.98	3 53.97	1 6 54.0	6 54.1	7.6198	8.443				
15 12 23.2	259	0 3 47.97	3 47.96	1 7 34.0	7 34.1	7.6212	8.444				
16 12 19.2	260	0 3 41.94	3 41.93	1 8 14.0	8 14.1	7.6223	8.444				
17 12 15.2	261	0 3 35.90	3 35.89	1 8 54.1	8 54.2	7.6230	8.445				
18 12 11.2	262	0 3 29.85	3 29.84	1 9 34.2	9 34.3	7.6238	8.445				
19 12 7.1	263	0 3 23.79	3 23.78	1 10 14.3	10 14.4	7.6245	8.445				
20 12 3.1	264	0 3 17.72	3 17.71	1 10 54.4	10 54.5	7.6252	8.445				
21 11 59.1	265	0 3 11.64	3 11.63	1 11 34.5	11 34.6	7.6255	8.445				
22 11 55.1	266	0 3 5.56	3 5.55	1 12 14.6	12 14.7	7.6259	8.444				
23 11 51.0	267	0 2 59.47	2 59.46	1 12 54.6	12 54.7	7.6262	8.444				
24 11 47.0	268	0 2 53.38	2 53.37	1 13 34.6	13 34.7	7.6262	8.443	+1.72	+2.68		
25 11 43.0	269	0 2 47.29	2 47.28	1 14 14.5	14 14.6	7.6259	8.442	1.77	2.72		
26 11 39.0	270	0 2 41.21	2 41.20	1 14 54.3	14 54.4	7.6252	8.441	1.81	2.75		
27 11 34.9	271	0 2 35.14	2 35.13	1 15 34.0	15 34.1	7.6245	8.440	1.85	2.77		
28 11 30.9	272	0 2 29.07	2 29.06	1 16 13.6	16 13.7	7.6238	8.439	1.88	2.79		
29 11 26.9	273	0 2 23.02	2 23.01	1 16 53.1	16 53.2	7.6230	8.437	1.91	2.82		
30 11 22.8	274	0 2 16.98	2 16.97	1 17 32.4	17 32.5	7.6219	8.435	1.94	2.84		
Oct. 1 11 18.8	275	0 2 10.96	2 10.95	1 18 11.5	18 11.6	7.6205	8.433	1.97	2.86		
2 11 14.8	276	0 2 4.96	2 4.95	1 18 50.5	18 50.5	7.6190	8.431	2.00	2.88		
3 11 10.7	277	0 1 58.98	1 58.97	1 19 29.3	19 29.3	7.6172	8.429	2.02	2.90		
4 11 6.7	278	0 1 53.03	1 53.02	1 20 7.8	20 7.8	7.6151	8.426	2.04	2.92		
5 11 2.6	279	0 1 47.11	1 47.10	1 20 46.1	20 46.1	7.6129	8.423	2.06	2.94		
6 10 58.6	280	0 1 41.21	1 41.20	1 21 24.2	21 24.2	7.6106	8.420	2.08	2.96		
7 10 54.6	281	0 1 35.34	1 35.33	1 22 2.0	22 2.0	7.6084	8.417	2.10	2.98		
8 10 50.6	282	0 1 29.51	1 29.50	1 22 39.5	22 39.5	7.6062	8.414	2.12	3.00		
9 10 46.5	283	0 1 23.71	1 23.70	1 23 16.7	23 16.7	7.6035	8.411	2.14	3.01		
10 10 42.5	284	0 1 17.94	1 17.93	1 23 53.7	23 53.7	7.6005	8.407	2.15	3.02		
11 10 38.5	285	0 1 12.22	1 12.21	1 24 30.3	24 30.3	7.5975	8.403	2.17	3.04		
12 10 34.5	286	0 1 6.55	1 6.54	1 25 6.6	25 6.6	7.5940	8.399	2.18	3.05		
13 10 30.4	287	0 1 0.93	1 0.92	1 25 42.5	25 42.5	7.5902	8.395	2.20	3.06		
14 10 26.4	288	0 0 55.35	0 55.34	1 26 18.1	26 18.1	7.5863	8.391	2.21	3.07		
15 10 22.4	289	0 0 49.82	0 49.82	1 26 53.3	26 53.3	7.5824	8.386	2.23	3.08		
16 10 18.4	290	0 0 44.34	0 44.34	1 27 28.1	27 28.1	7.5780	8.381	2.24	3.09		
17 10 14.3	291	0 0 38.92	0 38.92	1 28 2.5	28 2.5	7.5732	8.376	2.25	3.10		
18 10 10.3	292	0 0 33.56	0 33.56	1 28 36.4	28 36.4	7.5683	8.370	2.26	3.11		
19 10 6.3	293	0 0 28.25	0 28.25	1 29 9.9	29 9.9	7.5634	8.364	2.27	3.12		
20 10 2.3	294	0 0 23.00	0 23.00	1 29 43.0	29 43.0	7.5584	8.358	2.28	3.13		
21 9 58.2	295	0 0 17.82	0 17.82	1 30 15.6	30 15.6	7.5534	8.352	2.29	3.14		
22 9 54.2	296	0 0 12.70	0 12.70	1 30 47.8	30 47.8	7.5479	8.346	2.30	3.15		
23 9 50.2	297	0 0 7.65	0 7.65	1 31 19.5	31 19.5	7.5418	8.339	2.31	3.16		
24 9 46.2	298	0 0 2.66	0 2.66	1 31 50.7	31 50.7	7.5357	8.332	2.32	3.17		
25 9 42.2	299	23 59 57.75	59 57.75	1 32 21.3	32 21.3	7.5292	8.324	2.33	3.18		
26 9 38.2	300	23 59 52.90	59 52.90	1 32 51.4	32 51.4	7.5222	8.316	2.34	3.18		
27 9 34.2	301	23 59 48.13	59 48.13	1 33 21.0	33 21.0	7.5165	8.308	2.35	3.19		
28 9 30.1	302	23 59 43.44	59 43.44	1 33 50.0	33 50.0	7.5091	8.300	2.36	3.20		
29 9 26.1	303	23 59 38.83	59 38.83	1 34 18.5	34 18.5	7.5015	8.292	2.37	3.21		
30 9 22.1	304	23 59 34.29	59 34.29	1 34 46.5	34 46.5	7.4938	8.284	2.37	3.21		
31 9 18.1	305	23 59 29.84	59 29.84	1 35 13.9	35 13.9	7.4860	8.275	2.38	3.22		
32 9 14.1	306	23 59 25.47	59 25.47	-1 35 40.7	35 40.7	-7.4776	-8.265	+2.38	+3.22		

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1	d	h	m	d	h	m	s				
2	9	14.1	306	23 59 25.47	59 25.47	- 1 35 40.7	35 40.7	-7.4776	-8.265	+2.38	+3.22
3	9	10.1	307	23 59 21.19	59 21.19	1 36 6.9	36 6.9	7.4684	8.255	2.39	3.23
4	9	6.1	308	23 59 16.99	59 16.99	1 36 32.4	36 32.4	7.4591	8.245	2.39	3.23
5	9	2.1	309	23 59 12.89	59 12.89	1 36 57.4	36 57.4	7.4496	8.234	2.40	3.24
6	8	58.1	310	23 59 8.88	59 8.88	1 37 21.7	37 21.7	7.4398	8.222	2.40	3.24
7	8	54.1	311	23 59 4.96	59 4.96	1 37 45.3	37 45.3	7.4293	8.210	2.41	3.25
8	8	50.1	312	23 59 1.14	59 1.14	1 38 8.3	38 8.3	7.4179	8.197	2.41	3.25
9	8	46.1	313	23 58 57.42	58 57.42	1 38 30.6	38 30.6	7.4063	8.183	2.42	3.26
10	8	42.1	314	23 58 53.80	58 53.80	1 38 52.2	38 52.2	7.3943	8.169	2.42	3.26
11	8	38.1	315	23 58 50.27	58 50.27	1 39 13.1	39 13.1	7.3819	8.155	2.43	3.27
12	8	34.1	316	23 58 46.84	58 46.84	1 39 33.4	39 33.4	7.3692	8.140	2.43	3.27
13	8	30.2	317	23 58 43.52	58 43.52	1 39 53.0	39 53.0	7.3555	8.125	2.44	3.27
14	8	26.2	318	23 58 40.31	58 40.31	1 40 11.9	40 11.9	7.3413	8.109	2.44	3.28
15	8	22.2	319	23 58 37.20	58 37.20	1 40 30.1	40 30.1	7.3273	8.092	2.44	3.28
16	8	18.2	320	23 58 34.19	58 34.19	1 40 47.5	40 47.5	7.3121	8.073	2.45	3.28
17	8	14.2	321	23 58 31.29	58 31.29	1 41 4.2	41 4.2	7.2957	8.054	2.45	3.28
18	8	10.2	322	23 58 28.50	58 28.50	1 41 20.1	41 20.1	7.2786	8.034	2.45	3.29
19	8	6.3	323	23 58 25.82	58 25.82	1 41 35.3	41 35.3	7.2599	8.013	2.46	3.29
20	7	58.3	324	23 58 23.26	58 23.26	1 41 49.8	41 49.8	7.2404	7.991	2.46	3.29
21	7	54.3	325	23 58 20.81	58 20.81	1 42 3.5	42 3.5	7.2209	7.966	2.46	3.29
22	7	50.4	326	23 58 18.47	58 18.47	1 42 16.4	42 16.4	7.2005	7.940	2.46	3.29
23	7	46.4	327	23 58 16.24	58 16.24	1 42 28.6	42 28.6	7.1791	7.913	2.47	3.30
24	7	42.4	328	23 58 14.13	58 14.13	1 42 40.0	42 40.0	7.1555	7.883	2.47	3.30
25	7	38.5	329	23 58 12.13	58 12.13	1 42 50.6	42 50.6	7.1288	7.850	2.47	3.30
26	7	34.5	330	23 58 10.25	58 10.25	1 43 0.4	43 0.4	7.1017	7.815	2.47	3.30
27	7	30.5	331	23 58 8.49	58 8.49	1 43 9.4	43 9.4	7.0720	7.776	2.48	3.30
28	7	26.6	332	23 58 6.85	58 6.85	1 43 17.6	43 17.6	7.0403	7.734	2.48	3.30
29	7	22.6	333	23 58 5.33	58 5.33	1 43 25.0	43 25.0	7.0060	7.687	2.48	3.30
30	7	18.6	334	23 58 3.93	58 3.93	1 43 31.6	43 31.6	6.9687	7.634	2.48	3.30
Dec. 1	7	14.7	335	23 58 2.65	58 2.65	1 43 37.4	43 37.4	6.9280	7.574	2.48	3.30
2	7	10.7	336	23 58 1.49	58 1.49	1 43 42.3	43 42.3	6.8819	7.504	2.48	3.30
3	7	6.8	337	23 58 0.46	58 0.46	1 43 46.5	43 46.5	6.8293	7.416	2.48	3.30
4	7	2.8	338	23 57 59.55	57 59.55	1 43 49.8	43 49.8	6.7695	7.304	2.49	3.30
5	6	58.9	339	23 57 58.77	57 58.77	1 43 52.3	43 52.3	6.7001	7.164	2.49	3.30
6	6	54.9	340	23 57 58.11	57 58.11	1 43 54.0	43 54.0	6.6161	6.955	2.49	3.30
7	6	51.0	341	23 57 57.57	57 57.57	1 43 54.9	43 54.9	6.5109	-6.495	2.49	3.30
8	6	47.1	342	23 57 57.17	57 57.17	1 43 54.9	43 54.9	6.3756	+6.444	2.49	3.30
9	6	43.2	343	23 57 56.89	57 56.89	1 43 54.1	43 54.1	6.1781	6.938	2.49	3.30
10	6	39.2	344	23 57 56.74	57 56.74	1 43 52.4	43 52.4	-5.8054	7.164	2.49	3.30
11	6	35.3	345	23 57 56.71	57 56.71	1 43 49.9	43 49.9	+5.3857	7.304	2.49	3.30
12	6	31.4	346	23 57 56.81	57 56.81	1 43 46.6	43 46.6	6.0591	7.416	2.49	3.30
13	6	27.4	347	23 57 57.04	57 57.04	1 43 42.4	43 42.4	6.3114	7.504	2.49	3.29
14	6	23.5	348	23 57 57.40	57 57.40	1 43 37.4	43 37.4	6.4700	7.574	2.48	3.29
15	6	19.6	349	23 57 57.89	57 57.89	1 43 31.6	43 31.6	6.5859	7.637	2.48	3.29
16	6	15.7	350	23 57 58.50	57 58.50	1 43 24.9	43 24.9	6.6741	7.693	2.48	3.29
17	6	11.8	351	23 57 59.24	57 59.24	1 43 17.4	43 17.4	6.7447	7.739	2.48	3.29
18	6	7.9	352	23 58 0.10	58 0.10	1 43 9.1	43 9.1	6.8077	7.781	2.48	3.29
19	6	4.0	353	23 58 1.09	58 1.09	1 43 0.0	43 0.0	6.8649	7.819	2.48	3.29
20	6	0.1	354	23 58 2.21	58 2.21	1 42 50.1	42 50.1	6.9154	7.856	2.48	3.29
21	5	56.1	355	23 58 3.45	58 3.45	1 42 39.3	42 39.3	6.9589	7.891	2.48	3.29
22	5	52.2	356	23 58 4.83	58 4.83	1 42 27.7	42 27.7	7.0000	7.921	2.48	3.29
23	5	48.3	357	23 58 6.33	58 6.33	1 42 15.3	42 15.3	7.0347	7.949	2.48	3.28
24	5	44.4	358	23 58 7.95	58 7.95	1 42 2.1	42 2.1	7.0682	7.975	2.48	3.28
25	5	40.5	359	23 58 9.70	58 9.70	1 41 48.1	41 48.1	7.0993	8.000	2.48	3.28
26	5	36.6	360	23 58 11.57	58 11.57	1 41 33.2	41 33.2	7.1283	8.023	2.48	3.28
27	5	32.7	361	23 58 13.57	58 13.57	1 41 17.6	41 17.6	7.1555	8.046	2.48	3.28
28	5	28.8	362	23 58 15.69	58 15.69	1 41 1.2	41 1.2	7.1811	8.067	2.48	3.28
29	5	24.9	363	23 58 17.94	58 17.94	1 41 43.9	41 43.9	7.2061	8.088	2.47	3.27
30	5	21.0	364	23 58 20.32	58 20.32	1 40 25.8	40 25.8	7.2290	8.108	2.47	3.27
31	5	17.1	365	23 58 22.82	58 22.82	1 40 6.9	40 6.9	7.2507	8.127	2.47	3.27
32	5	13.2	366	23 58 25.45	58 25.45	1 39 47.2	39 47.2	7.2714	8.145	2.47	3.27
			367	23 58 28.20	58 28.20	- 1 39 26.7	39 26.7	+7.2911	+8.161	+2.47	+3.27

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

Jh. Sidereal Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
1	6.65	6.37	6.50	2.59	6.34	3.85	0.19	0.45	0.26
6	6.39	6.26	6.30	2.49	6.22	3.72	0.18	0.45	0.25
11	6.22	6.14	6.12	2.42	6.11	3.61	0.18	0.44	0.24
16	6.11	6.03	5.94	2.38	6.00	3.51	0.17	0.43	0.23
21	6.06	5.93	5.77	2.36	5.90	3.41	0.17	0.43	0.23
26	6.06	5.84	5.61	2.36	5.81	3.31	0.17	0.42	0.22
31	6.13	5.75	5.46	2.38	5.72	3.22	0.17	0.41	0.21
36	6.29	5.67	5.31	2.44	5.64	3.14	0.17	0.40	0.21
41	6.55	5.60	5.18	2.55	5.57	3.06	0.17	0.40	0.21
46	6.99	5.53	5.06	2.72	5.50	2.98	0.18	0.39	0.20
51	7.69	5.46	4.92	2.98	5.44	2.91	0.20	0.38	0.20
56	8.72	5.40	4.81	3.38	5.38	2.83	0.23	0.37	0.19
61	10.14	5.34	4.71	3.94	5.32	2.77	0.26	0.37	0.19
66	11.81	5.29	4.61	4.59	5.26	2.71	0.31	0.36	0.18
71	13.33	5.25	4.51	5.19	5.22	2.66	0.35	0.36	0.18
76	14.14	5.20	4.41	5.50	5.17	2.60	0.36	0.35	0.18
81	14.01	5.15	4.32	5.45	5.13	2.55	0.36	0.34	0.18
86	13.20	5.12	4.24	5.14	5.09	2.50	0.34	0.34	0.18
91	12.15	5.08	4.16	4.73	5.06	2.45	0.32	0.34	0.17
96	11.11	5.06	4.09	4.32	5.03	2.41	0.29	0.34	0.17
101	10.17	5.03	4.02	3.95	5.01	2.37	0.26	0.33	0.17
106	9.35	5.01	3.95	3.63	4.99	2.33	0.24	0.34	0.17
111	8.64	4.99	3.89	3.36	4.97	2.29	0.22	0.34	0.17
116	8.04	4.98	3.83	3.12	4.96	2.26	0.21	0.34	0.16
121	7.53	4.97	3.77	2.93	4.94	2.22	0.20	0.34	0.16
126	7.10	4.96	3.72	2.76	4.93	2.19	0.19	0.34	0.16
131	6.78	4.96	3.67	2.63	4.93	2.16	0.18	0.35	0.16
136	6.57	4.96	3.62	2.55	4.93	2.14	0.18	0.35	0.16
141	6.49	4.96	3.58	2.53	4.94	2.11	0.18	0.35	0.15
146	6.60	4.97	3.54	2.57	4.95	2.08	0.19	0.36	0.15
151	6.87	4.98	3.50	2.68	4.96	2.06	0.20	0.36	0.15
156	7.31	4.99	3.47	2.85	4.98	2.04	0.21	0.36	0.15
161	7.90	5.02	3.44	3.08	5.00	2.02	0.23	0.36	0.15
166	8.63	5.06	3.41	3.36	5.03	2.00	0.25	0.37	0.14
171	9.47	5.09	3.38	3.68	5.06	1.99	0.27	0.37	0.14
176	10.43	5.12	3.35	4.06	5.10	1.97	0.29	0.37	0.14
181	11.49	5.17	3.33	4.48	5.14	1.96	0.32	0.37	0.14
186	12.62	5.22	3.31	4.92	5.19	1.95	0.34	0.37	0.14
191	13.70	5.27	3.29	5.34	5.24	1.94	0.37	0.37	0.14
196	14.60	5.32	3.27	5.64	5.29	1.93	0.39	0.37	0.14
201	14.76	5.38	3.25	5.74	5.36	1.92	0.40	0.37	0.13
206	14.25	5.45	3.24	5.54	5.43	1.91	0.38	0.37	0.13
211	13.07	5.53	3.23	5.08	5.50	1.90	0.35	0.38	0.13
216	11.54	5.61	3.22	4.49	5.58	1.90	0.31	0.38	0.13
221	10.02	5.70	3.22	3.89	5.66	1.89	0.27	0.38	0.13
226	8.70	5.79	3.21	3.38	5.76	1.89	0.24	0.39	0.13
231	7.69	5.89	3.21	2.99	5.87	1.89	0.21	0.39	0.13
236	6.99	5.99	3.21	2.72	5.98	1.89	0.19	0.40	0.13
241	6.55	6.11	3.21	2.55	6.09	1.89	0.18	0.41	0.13
246	6.30	6.24	3.21	2.46	6.21	1.89	0.17	0.42	0.13
251	6.19	6.38	3.22	2.41	6.35	1.89	0.16	0.43	0.13
256	6.17	6.53	3.22	2.40	6.49	1.89	0.16	0.44	0.13
261	6.22	6.68	3.23	2.43	6.64	1.90	0.16	0.45	0.13
266	6.34	6.83	3.24	2.47	6.80	1.91	0.17	0.47	0.13
271	6.51	7.01	3.25	2.53	6.98	1.92	0.17	0.49	0.13
276	6.75	7.20	3.27	2.63	7.17	1.92	0.18	0.51	0.13
281	7.07	7.41	3.29	2.76	7.37	1.94	0.19	0.53	0.13
286	7.50	7.63	3.31	2.92	7.58	1.96	0.21	0.54	0.13
291	8.06	7.85	3.33	3.14	7.81	1.96	0.22	0.57	0.13
296	8.80	8.10	3.35	3.43	8.06	1.98	0.25	0.59	0.13

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

0 ^h . Sidereal Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
301 ^d	9.77	8.37	3.38	3.81	8.34	1.97	0.28	0.61	0.13
306	10.98	8.66	3.41	4.28	8.62	2.01	0.31	0.64	0.13
311	12.17	8.98	3.44	4.74	8.94	2.03	0.34	0.66	0.14
316	12.61	9.35	3.48	4.91	9.30	2.05	0.34	0.69	0.14
321	11.84	9.73	3.52	4.60	9.69	2.07	0.31	0.72	0.14
326	10.40	10.15	3.56	4.05	10.10	2.09	0.27	0.74	0.14
331	9.05	10.60	3.60	3.53	10.55	2.12	0.24	0.77	0.14
336	8.04	11.11	3.64	3.13	11.05	2.15	0.21	0.80	0.15
341	7.33	11.68	3.69	2.85	11.61	2.18	0.20	0.83	0.15
346	6.85	12.29	3.74	2.66	12.23	2.20	0.19	0.86	0.15
351	6.50	12.97	3.79	2.53	12.92	2.24	0.18	0.91	0.16
356	6.26	13.75	3.85	2.43	13.69	2.28	0.18	0.96	0.16
361	6.10	14.61	3.91	2.38	14.53	2.31	0.17	1.01	0.16
366	6.01	15.55	3.98	2.33	15.44	2.35	0.17	1.06	0.17
0 ^h . Sidereal Date.	♂	♀	♂	♂	♀	♂	♂	♀	♂
1 ^d	1.86	0.98	0.46	20.89	8.94	1.81	1.49	0.60	0.13
11	1.90	1.00	0.46	21.35	9.09	1.80	1.52	0.61	0.13
21	1.93	1.01	0.46	21.72	9.21	1.78	1.55	0.62	0.13
31	1.95	1.02	0.45	21.94	9.30	1.77	1.57	0.63	0.13
41	1.96	1.03	0.45	22.02	9.36	1.75	1.58	0.63	0.13
51	1.96	1.03	0.45	21.93	9.39	1.74	1.57	0.64	0.12
61	1.94	1.03	0.44	21.70	9.39	1.72	1.56	0.64	0.12
71	1.91	1.03	0.44	21.33	9.36	1.71	1.54	0.64	0.12
81	1.87	1.02	0.44	20.86	9.29	1.70	1.51	0.63	0.12
91	1.82	1.01	0.44	20.33	9.19	1.68	1.47	0.63	0.12
101	1.77	1.00	0.43	19.76	9.07	1.67	1.43	0.62	0.12
111	1.71	0.99	0.43	19.17	8.93	1.66	1.39	0.61	0.12
121	1.66	0.97	0.43	18.60	8.78	1.66	1.34	0.60	0.12
131	1.61	0.96	0.42	18.05	8.62	1.65	1.30	0.59	0.12
141	1.56	0.93	0.42	17.53	8.46	1.65	1.26	0.58	0.12
151	1.52	0.92	0.42	17.06	8.31	1.65	1.22	0.57	0.12
161	1.48	0.90	0.43	16.63	8.17	1.66	1.19	0.56	0.12
171	1.45	0.89	0.43	16.25	8.04	1.66	1.16	0.55	0.12
181	1.42	0.87	0.43	15.92	7.92	1.67	1.13	0.54	0.12
191	1.40	0.86	0.43	15.64	7.82	1.68	1.11	0.53	0.12
201	1.38	0.85	0.44	15.41	7.73	1.69	1.09	0.53	0.12
211	1.36	0.84	0.44	15.24	7.66	1.70	1.08	0.52	0.13
221	1.35	0.84	0.44	15.11	7.61	1.71	1.07	0.52	0.13
231	1.34	0.83	0.44	15.03	7.57	1.72	1.06	0.51	0.13
241	1.34	0.83	0.45	14.99	7.55	1.73	1.05	0.51	0.13
251	1.34	0.83	0.45	15.01	7.54	1.74	1.05	0.51	0.13
261	1.35	0.83	0.45	15.08	7.55	1.76	1.05	0.51	0.13
271	1.36	0.84	0.45	15.19	7.58	1.78	1.06	0.51	0.13
281	1.37	0.84	0.46	15.35	7.63	1.79	1.07	0.51	0.13
291	1.39	0.85	0.46	15.57	7.70	1.80	1.08	0.52	0.13
301	1.41	0.85	0.46	15.84	7.78	1.81	1.10	0.52	0.13
311	1.44	0.86	0.47	16.16	7.88	1.82	1.12	0.53	0.13
321	1.48	0.87	0.47	16.53	8.00	1.83	1.15	0.53	0.13
331	1.52	0.88	0.47	16.96	8.13	1.83	1.18	0.54	0.13
341	1.56	0.90	0.47	17.43	8.26	1.83	1.21	0.55	0.13
351	1.60	0.92	0.47	17.95	8.40	1.83	1.24	0.56	0.13
361	1.65	0.94	0.47	18.50	8.55	1.82	1.28	0.57	0.13
371	1.71	0.95	0.47	19.09	8.71	1.82	1.32	0.58	0.13

NOTE. — For Neptune the Horizontal Parallax = 0".28 (before 1804.)
 " " " " = 0".29 (between 1804. and 227d. and after 304d.)
 " " " " = 0".30 (between 227d. and 304d.)

380 SUN'S COÖRDINATES, 1861.

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = r .
Jan. 1.0	+1936821	6054	-8842791	2990	-3837299	7223	281° 21' 30.3	22.0	-0.69	926483
1.5	2022496	1727	8826686	6892	3830314	0240	281° 51' 74.0	57.5	0.73	926508
2.0	2108017	7245	8809895	0109	3823030	2960	282° 22' 48.7	32.1	0.77	926539
2.5	2193379	2605	8792419	2640	3815448	5381	282° 53' 23.5	6.8	0.80	926576
3.0	2278573	7796	8774259	4488	3807569	7506	283° 23' 58.3	41.5	0.82	926619
3.5	+2363594	2815	-8755416	5652	-3799393	9333	283° 54' 33.2	16.3	-0.83	926668
4.0	2448434	7632	8735890	6134	3790921	0665	284° 24' 68.1	51.1	0.84	926722
4.5	2533087	2303	8715683	5934	3782153	2100	284° 55' 43.0	26.0	0.83	926782
5.0	2617547	6761	8694797	5056	3773089	3040	285° 26' 18.0	0.9	0.82	926847
5.5	2701806	1018	8673233	3499	3763729	3683	285° 56' 53.0	35.8	0.80	926917
6.0	+2785859	5069	-8650991	1264	-3754073	4031	286° 27' 28.0	10.7	-0.78	926992
6.5	2869698	8907	8628073	8353	3744124	4085	286° 57' 63.0	45.6	0.75	927072
7.0	2953315	2522	8604482	4770	3733886	3851	287° 28' 38.0	20.5	0.71	927157
7.5	3036705	5911	8580218	0513	3723356	3324	287° 58' 73.0	55.4	0.67	927247
8.0	3119859	9063	8555282	5585	3712534	2506	288° 29' 48.0	30.3	0.62	927340
8.5	+3202773	1976	-8529677	9987	-3701421	1397	289° 0' 23.0	5.2	-0.56	927438
9.0	3285437	4638	8503405	3723	3690017	9997	289° 30' 57.9	40.0	0.50	927540
9.5	3367846	7046	8476467	6792	3678324	8308	290° 1' 32.8	14.8	0.44	927647
10.0	3449091	9193	8448867	9200	3666344	6332	290° 31' 67.6	49.6	0.38	927757
10.5	3531872	1070	8420606	0946	3654077	4069	291° 2' 42.3	24.2	0.31	927872
11.0	+3613476	2673	-8391687	2035	-3641525	1521	291° 32' 76.9	58.7	-0.24	927991
11.5	3694797	3993	8362112	2467	3628688	8688	292° 3' 51.4	33.1	0.17	928115
12.0	3775827	5022	8331824	2247	3615567	5571	292° 34' 25.7	7.3	0.11	928242
12.5	3856552	5756	8301005	1375	3602165	2173	293° 4' 59.9	41.4	-0.05	928373
13.0	3936994	6187	8269478	9855	3588481	8493	293° 35' 34.0	15.4	+0.01	928510
13.5	+4017117	6310	-8237305	7689	-3574517	4533	294° 5' 68.0	49.3	+0.07	928650
14.0	4096924	6116	8204491	4883	3560274	0294	294° 36' 41.8	23.0	0.12	928793
14.5	4176409	5601	8171037	1437	3545754	5778	295° 6' 75.5	56.6	0.17	928941
15.0	4255566	4757	8136946	7354	3530958	0986	295° 37' 49.0	30.1	0.21	929092
15.5	4334389	3580	8102221	2636	3515887	5919	296° 8' 22.2	3.3	0.25	929248
16.0	+4412870	2061	-8066865	7288	-3500543	0679	296° 38' 55.2	36.2	+0.28	929409
16.5	4491005	0196	8030882	1313	3484928	4068	297° 9' 28.0	8.8	0.30	929575
17.0	4568786	7977	7994276	4715	3469043	9087	297° 39' 60.6	41.3	0.31	929746
17.5	4646208	5399	7957049	7496	3452889	2937	298° 10' 32.9	13.5	0.32	929922
18.0	4723265	2457	7919207	9652	3436468	6520	298° 40' 66.0	45.5	0.32	930103
18.5	+4799051	9143	-7880751	1212	-3419781	9837	299° 11' 36.9	17.3	+0.31	930289
19.0	4876261	5454	7841686	2157	3402830	2890	299° 41' 68.5	48.9	0.29	930481
19.5	4952189	1382	7802016	2495	3385616	5680	300° 12' 39.9	20.2	0.27	930679
20.0	5027731	6924	7761742	2229	3368141	8210	300° 42' 71.0	51.3	0.25	930883
20.5	5102880	2074	7729869	1364	3350406	0479	301° 13' 41.9	22.1	0.21	931092
21.0	+5177632	6827	-7670401	9905	-3332413	2490	301° 43' 72.5	52.6	+0.17	931307
21.5	5251981	1177	7637341	7853	3314164	4245	302° 14' 42.9	22.9	0.12	931529
22.0	5325922	5119	7594691	5212	3295660	5745	302° 44' 73.0	52.9	0.07	931757
22.5	5399450	8648	7551456	1985	3276902	6991	303° 15' 42.8	22.6	+0.01	931992
23.0	5472556	1756	7507640	8177	3257891	7984	303° 45' 72.4	52.1	-0.05	932232
23.5	+5545238	4440	-7463245	3790	-3238630	8727	304° 16' 41.7	21.4	-0.11	932479
24.0	5617490	6693	7418274	8828	3219119	9221	304° 46' 70.8	50.4	0.18	932732
24.5	5689307	8512	7372731	3294	3199359	9465	305° 17' 39.7	19.3	0.24	932992
25.0	5760686	9892	7326621	7193	3179354	9465	305° 47' 68.3	47.8	0.21	933258
25.5	5831621	0829	7279947	0528	3159104	9219	306° 18' 36.7	16.1	0.38	933531
26.0	+5902108	1318	-7232712	3302	-3138610	8729	306° 48' 64.8	44.1	-0.45	933810
26.5	5972142	1354	7184919	5517	3117874	7997	307° 19' 32.7	11.9	0.51	934097
27.0	6041715	0929	7136571	7178	3096898	7026	307° 49' 60.4	39.5	0.57	934389
27.5	6110823	0040	7087675	8290	3075683	5815	308° 20' 27.9	6.9	0.62	934689
28.0	6179462	8681	7038232	8856	3054230	4367	308° 50' 55.1	34.0	0.67	934995
28.5	+6247627	6849	-6988246	8878	-3032542	2683	309° 21' 22.1	1.0	-0.71	935308
29.0	6315313	4537	6937721	8362	3010619	0765	309° 51' 48.9	27.7	0.74	935626
29.5	6382513	1740	6886660	7309	2988462	8612	310° 21' 75.5	54.3	0.77	935950
30.0	6449225	8455	6835067	5725	2966074	6229	310° 52' 41.9	20.6	0.79	936280
30.5	6515443	4677	6782945	3611	2943456	3615	311° 22' 68.1	46.7	0.80	936615
31.0	+6581158	0395	-6730298	0973	-2920611	0774	311° 53' 34.0	12.5	-0.81	936956

NOTE. — The accented letters correspond to the mean equinox and equator of January (d.0).

SUN'S COÖRDINATES, 1861. 381

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Jan. 31.5	+6646368	5608	-6677129	7813	-2897540	7707	312° 23' 59.8"	38.2	-0.81	937302	
Feb. 1.0	6711070	0313	6623443	4134	2874243	4414	312 54 25.3	3.6	0.81	937654	
1.5	6775256	4502	6569243	9943	2850723	1798	313 24 50.7	29.0	0.79	938011	
2.0	6838924	8174	6514534	5242	2826982	7162	313 54 75.8	54.0	0.77	938372	
2.5	6902066	1320	6459319	0036	2803020	3204	314 25 40.7	18.9	0.74	938739	
3.0	+6964679	3937	-6403601	4326	-2778841	9030	314 55 65.3	43.4	-0.71	939109	
3.5	7026759	6022	6347387	8120	2754445	4638	315 26 29.8	7.9	0.66	939484	
4.0	7088298	7565	6280680	1421	2729635	0033	315 56 54.0	32.0	0.61	939863	
4.5	7149291	8563	6223486	4236	2705012	5214	316 26 78.0	55.9	0.56	940247	
5.0	7209732	9008	6175808	6566	2679980	0186	316 57 41.7	19.5	0.50	940634	
5.5	+7269619	8900	-6117651	8417	-2654739	4949	317 27 65.1	42.8	-0.44	941025	
6.0	7323946	8232	6069020	9794	2629293	9507	317 58 28.3	5.9	0.38	941420	
6.5	7387708	6999	5999917	0699	2603642	3860	318 28 51.2	28.8	0.32	941817	
7.0	7445900	5196	5940349	1138	2577790	8013	318 58 73.8	51.3	0.25	942218	
7.5	7503517	2818	5880320	1117	2551737	1964	319 29 36.1	13.6	0.18	942622	
8.0	+7560553	9859	-5819833	0638	-2525487	5719	319 59 58.1	35.5	-0.11	943028	
8.5	7617003	6314	5758894	9707	2499041	9277	320 29 79.9	57.3	+0.05	943437	
9.0	7672365	2181	5697510	8331	2472401	2642	321 0 41.3	18.6	0.02	943848	
9.5	7728134	7455	5635685	6514	2445570	5815	321 30 62.3	39.5	0.08	944262	
10.0	7782907	2134	5573424	4260	2418550	8800	322 1 22.9	0.0	0.13	944679	
10.5	+7836880	6213	-5510733	1577	-2391343	1597	322 31 43.2	20.2	+0.18	945099	
11.0	7890347	9686	5447618	8469	2363952	4211	323 1 63.2	40.1	0.23	945521	
11.5	7943204	2549	5384083	4942	2336379	6642	323 31 82.8	59.7	0.27	945947	
12.0	7995446	4798	5320134	1000	2308626	8894	324 2 41.9	18.7	0.30	946374	
12.5	8047069	6427	5255776	6650	2280696	0968	324 32 60.7	37.5	0.33	946804	
13.0	+8098070	7435	-5191015	1896	-2252693	2870	325 2 79.0	55.7	+0.35	947238	
13.5	8148445	7816	5125857	6746	2224317	4598	325 33 36.9	13.5	0.36	947674	
14.0	8198191	7569	5060306	1202	2195871	6156	326 3 54.4	31.0	0.37	948114	
14.5	8247305	6690	4994368	5271	2167257	7546	326 33 71.4	47.9	0.36	948556	
15.0	8295785	5177	4928049	8959	2138480	8774	327 4 28.0	4.4	0.35	949002	
15.5	+8343627	3026	-4861354	2271	-2109540	9838	327 34 44.1	20.5	+0.32	949451	
16.0	8390826	0232	4794289	5212	2080439	0741	328 4 59.8	36.1	0.29	949904	
16.5	8437380	6793	4726860	7790	2051180	1486	328 34 75.0	51.2	0.26	950360	
17.0	8483326	2706	4659071	0008	2021766	2076	329 5 29.8	6.0	0.22	950820	
17.5	8528542	7969	4590929	1873	1992199	2513	329 35 44.1	20.2	0.18	951283	
18.0	+8573141	2575	-4522439	3389	-1962481	2799	330 5 57.9	34.0	+0.13	951750	
18.5	8617063	6524	4453607	4564	1932615	2937	330 35 71.2	47.2	0.08	952221	
19.0	8660365	9813	4384438	5401	1902603	2929	331 6 24.1	0.1	+0.02	952695	
19.5	8702384	2439	4314938	5907	1872448	2778	331 36 36.5	12.4	-0.04	953174	
20.0	8744938	4400	4245113	6089	1842151	2486	332 6 48.4	24.2	0.11	953657	
20.5	+8786226	5695	-4174968	5950	-1811715	2054	332 36 59.8	35.6	-0.17	954145	
21.0	8826344	6321	4104507	5495	1781143	1486	333 6 70.7	46.4	0.24	954637	
21.5	8866791	6275	4033737	4731	1750436	0783	333 36 81.2	56.9	0.30	955134	
22.0	8906062	5554	3962662	3662	1719597	9948	334 7 31.2	6.8	0.37	955635	
22.5	8944657	4156	3891287	2292	1688627	8982	334 37 40.7	16.3	0.43	956141	
23.0	+8982572	2079	-3819619	0629	-1657530	7889	335 7 49.8	25.3	-0.48	956651	
23.5	9019806	9321	3747662	8678	1626307	6670	335 37 58.4	33.9	0.53	957166	
24.0	9056356	5879	3675421	6442	1594961	5328	336 7 66.6	42.0	0.58	957686	
24.5	9092221	1752	3602902	3928	1563494	3865	336 37 74.4	49.8	0.62	958211	
25.0	9127398	6937	3530111	1142	1531908	2283	337 7 81.8	57.1	0.66	958740	
25.5	+9161885	1432	-3457051	8087	-1500205	0584	337 38 28.8	4.1	-0.69	959274	
26.0	9195679	5235	3383727	4768	1468389	8772	338 8 35.3	10.5	0.72	959812	
26.5	9228778	8342	3310146	1191	1436460	6847	338 38 41.4	16.6	0.74	960355	
27.0	9261179	0752	3236313	7363	1404421	4812	339 8 47.1	22.2	0.75	960901	
27.5	9292880	2461	3162233	3288	1372275	2670	339 38 52.4	27.5	0.75	961452	
28.0	+9333879	3469	-3087912	8972	-1340023	0421	340 8 57.3	32.3	-0.74	962006	
28.5	9354174	3773	3013355	4420	1307668	8070	340 38 61.8	36.8	0.73	962565	
Mar. 1.0	9383760	3367	2933567	9636	1275214	5619	341 8 65.9	40.8	0.71	963127	
1.5	9412638	2254	2863554	4628	1242661	3070	341 38 69.6	44.4	0.68	963693	
2.0	9440804	0429	2788321	9399	1210012	0424	342 8 72.9	47.6	0.64	964261	
2.5	+9468256	7890	-2712873	3956	-1177270	7686	342 38 75.8	50.5	-0.60	964832	

382 SUN'S COÖRDINATES, 1861.

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = r .
Mar. 3.0	+ .9494993	4637	— .2637218	8305	— .1144437	4856	343 8 75.3	52.9	— .55	965406
3.5	.9521012	0665	.2561360	2451	.1111516	1939	343 38 80.4	55.0	0.50	965983
4.0	.9546310	5072	.2485304	6399	.1078509	8935	344 8 82.1	56.6	0.44	966562
4.5	.9570886	0557	.2409056	10156	.1045418	5848	344 38 83.4	57.9	0.38	967144
5.0	.9594737	4418	.2332623	3727	.1012247	2680	345 8 84.3	58.7	0.32	967727
5.5	+ .9617863	7554	— .2256009	7118	— .0978997	9434	345 38 84.8	59.2	— .26	968312
6.0	.9640261	3962	.2179221	10334	.0945672	6112	346 8 84.9	59.2	0.19	968899
6.5	.9661930	1641	.2101264	2381	.0912273	2717	346 38 84.6	58.9	0.13	969487
7.0	.9682867	2588	.2025145	6266	.0878804	9251	347 8 83.9	58.1	0.06	970077
7.5	.9703071	2802	.1947869	8994	.0845266	5716	347 38 82.8	57.0	— .00	970667
8.0	+ .9722541	2283	— .1870444	1573	— .0811664	2117	348 8 81.3	55.4	+ .07	971259
8.5	.9741274	1026	.1792874	4006	.0777999	8455	348 38 79.3	53.4	0.13	971852
9.0	.9759269	8032	.1715165	6301	.0744275	4734	349 8 76.8	50.8	0.19	972445
9.5	.9776525	6298	.1637325	8465	.0710494	0956	349 38 73.8	47.8	0.24	973039
10.0	.9793039	2823	.1559361	10505	.0676660	7125	350 8 70.4	44.3	0.29	973633
10.5	+ .9808811	8605	— .1481279	2427	— .0642775	3243	350 38 66.5	40.4	+ .33	974227
11.0	.9823840	3645	.1403085	4236	.0608841	9312	351 8 62.1	35.9	0.38	974822
11.5	.9838126	7941	.1324785	5940	.0574861	5335	351 38 57.2	30.9	0.41	975417
12.0	.9851668	1494	.1246386	7544	.0540839	1316	352 8 51.8	25.5	0.44	976012
12.5	.9864466	4303	.1167894	9066	.0506777	7257	352 38 45.9	19.5	0.45	976607
13.0	+ .9876519	6367	— .1089314	10479	— .0472678	3161	353 8 39.4	13.0	+ .46	977203
13.5	.9887826	7685	.1010652	1820	.0438543	9029	353 38 32.5	6.0	0.45	977799
14.0	.9898336	8256	.0931917	3088	.0404377	4866	354 7 85.0	58.5	0.44	978395
14.5	.9908198	8079	.0853112	4285	.0370181	0673	354 37 77.0	50.4	0.43	978991
15.0	.9917262	7154	.0774246	5422	.0335957	6452	355 7 68.5	41.9	0.41	979587
15.5	+ .9925580	5483	— .0695323	6502	— .0301709	2207	355 37 59.4	32.7	+ .38	980184
16.0	.9933150	3064	.0616351	7533	.0267441	7941	356 7 49.8	23.1	0.34	980782
16.5	.9939973	9898	.0537335	8520	.0233154	3657	356 37 39.6	12.9	0.30	981380
17.0	.9946950	5986	.0458283	9470	.0198852	9358	357 7 28.7	1.9	0.25	981978
17.5	.9951381	1328	.0379200	10390	.0164537	5046	357 36 77.3	50.4	0.20	982577
18.0	+ .9955966	5924	— .0300092	1284	— .0130212	0723	358 6 65.3	38.4	+ .14	983177
18.5	.9959890	9774	.0220965	2160	.0095879	6393	358 36 52.7	25.7	0.09	983778
19.0	.9962905	2880	.0141825	3022	.0061541	2057	359 6 39.5	12.5	+ .03	984381
19.5	.9965250	5241	— .0062678	3878	— .0027200	7719	359 35 85.8	58.7	— .03	984985
20.0	.9966856	6358	+ .0016470	5268	+ .0007142	6621	0 5 71.5	44.4	0.09	985590
20.5	+ .9967719	7732	+ .0095613	4409	+ .0041482	0958	0 35 56.7	29.6	— .16	986196
21.0	.9967840	7865	.0174745	3539	.0075817	5291	1 5 41.2	14.0	0.22	986804
21.5	.9967219	7255	.0253860	2652	.0110146	9617	1 34 85.2	57.9	0.28	987413
22.0	.9965857	5905	.0332955	1745	.0144465	3934	2 4 68.6	41.3	0.34	988024
22.5	.9963754	3813	.0412022	0810	.0178773	8240	2 34 51.5	24.2	0.39	988636
23.0	+ .9960911	0982	+ .0491056	1943	+ .0213067	2532	3 4 33.8	6.4	— .44	989252
23.5	.9957330	7412	.0570052	18837	.0247345	6808	3 33 75.6	48.1	0.48	989869
24.0	.9953011	3105	.0649003	7787	.0281604	1065	4 3 56.8	29.3	0.52	990488
24.5	.9947954	8059	.0727905	6687	.0315842	5301	4 33 37.5	9.9	0.56	991109
25.0	.9942160	2277	.0806753	5534	.0350056	9513	5 2 77.6	50.0	0.59	991731
25.5	+ .9935630	5759	+ .0885540	4320	+ .0384245	3700	5 32 57.3	29.6	— .61	992355
26.0	.9928366	8507	.0964261	3041	.0418405	7858	6 2 36.4	8.7	0.63	992981
26.5	.9920363	0521	.1042910	1689	.0452533	1984	6 31 75.0	47.2	0.63	993610
27.0	.9911637	1802	.1121483	0262	.0486628	6077	7 1 53.0	25.2	0.63	994240
27.5	.9902174	2351	.1199973	8751	.0520689	0136	7 31 30.6	2.7	0.61	994872
28.0	+ .9891979	2168	+ .1278376	7154	+ .0554712	4158	8 0 67.7	39.8	— .60	995506
28.5	.9881054	1255	.1356686	5463	.0588696	8140	8 30 44.3	16.4	0.57	996141
29.0	.9869339	9612	.1434897	3674	.0622637	2080	8 59 80.5	52.5	0.54	996777
29.5	.9857016	7241	.1513005	1782	.0656534	5975	9 29 66.2	28.2	0.50	997415
30.0	.9843905	4142	.1591005	9782	.0690383	9823	9 59 31.4	3.3	0.45	998053
30.5	+ .9830066	0315	+ .1668890	7667	+ .0724183	3621	10 28 66.2	38.1	— .40	998693
31.0	.9815500	5762	.1746655	5433	.0757931	7368	10 58 40.5	12.3	0.35	999333
31.5	.9800209	0483	.1824294	3072	.0791625	1060	11 27 74.4	46.2	0.29	999973
Apr. 1.0	.9784191	4477	.1901802	0581	.0825262	4696	11 57 47.9	19.6	0.22	100613
1.5	.9767450	7748	.1979173	7953	.0858841	8274	12 26 80.9	52.5	0.16	101254
2.0	+ .9749986	10206	+ .2056402	5182	+ .0892358	1790	12 56 53.5	25.1	— .09	101894

☞ The first figures of this and the following logarithms are 0.0.

SUN'S COÖRDINATES, 1861. 383

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
Apr. 2.5	+ .9731800	2122	+ 2133482	2263	+ .0925810	5241	13° 25' 85.6"	57.1	+ 0.02	0.002534
3.0	.9712856	3229	2210409	9191	.0959195	8625	13 55 57.3	28.8	0.05	003174
3.5	.9693271	3617	2287177	5960	.0992511	1940	14 25 28.5	0.0	0.11	003814
4.0	.9672930	3289	2363778	2562	.1025755	5183	14 54 59.3	30.7	0.18	004452
4.5	.9651874	2246	2440209	8904	.1058925	8352	15 24 29.7	1.0	0.24	005089
5.0	+ .9630103	0487	+ 2516462	5249	+ .1092018	1444	15 53 59.6	30.9	+ 0.30	005725
5.5	.9607620	8016	2592532	1320	.1125031	4456	16 23 29.1	0.4	0.36	006360
6.0	.9584426	4834	2668411	7200	.1157961	2385	16 52 58.1	29.3	0.41	006992
6.5	.9560523	0943	2744096	2687	.1190806	0220	17 21 86.6	57.8	0.46	007623
7.0	.9535913	6345	2819580	8372	.1223565	2988	17 51 54.7	25.8	0.50	008252
7.5	+ .9510596	1040	+ 2894858	3651	+ .1256233	5655	18 20 82.3	53.4	+ 0.53	008879
8.0	.9484575	5031	2969923	8718	.1288808	8230	18 50 49.4	20.4	0.56	009503
8.5	.9457852	8320	3044770	3566	.1321289	0700	19 19 76.0	46.9	0.57	010125
9.0	.9430430	0911	3119393	8191	.1353672	3092	19 49 42.2	13.1	0.58	010745
9.5	.9402311	2804	3193787	2587	.1385955	5375	20 18 68.0	38.8	0.59	011362
10.0	+ .9373500	4006	+ 3267946	6748	+ .1418134	7554	20 48 33.2	4.0	+ 0.59	011977
10.5	.9343998	4516	3341863	0667	.1450209	9629	21 17 57.9	28.6	0.58	012589
11.0	.9313807	4337	3415532	4338	.1482177	1597	21 46 52.1	52.8	0.56	013199
11.5	.9282929	3471	3488949	7767	.1514035	3455	22 16 45.7	16.3	0.54	013806
12.0	.9251368	1922	3562108	0918	.1545780	5200	22 45 68.7	39.3	0.51	014411
12.5	+ .9219127	9693	+ 3635003	3815	+ .1577408	6828	23 15 31.3	1.8	+ 0.46	015013
13.0	.9186209	6787	3707629	6445	.1608919	8339	23 44 53.3	23.8	0.41	015613
13.5	.9152618	3208	3779980	8798	.1640312	9732	24 13 74.8	45.2	0.36	016210
14.0	.9118356	8959	3852050	0871	.1671583	1003	24 43 35.7	6.1	0.31	016805
14.5	.9083427	4042	3923834	2657	.1702730	2150	25 12 56.1	26.4	0.25	017398
15.0	+ .9047834	8462	+ 3995327	4153	+ .1733751	3171	25 41 75.9	46.1	+ 0.19	017988
15.5	.9011580	2220	4066524	5353	.1764643	4063	26 11 35.2	5.3	0.13	018577
16.0	.8974669	5321	4137421	6253	.1795405	4825	26 40 53.9	24.0	+ 0.07	019163
16.5	.8937104	7768	4208012	6847	.1826034	5454	27 9 72.0	42.0	0.00	019748
17.0	.8898888	9564	4278293	7131	.1856529	5950	27 38 89.5	59.5	- 0.06	020331
17.5	+ .8860024	0712	+ 4348258	7099	+ .1886888	6309	28 8 46.6	16.5	- 0.12	020912
18.0	.8820517	1218	4417903	6747	.1917107	6529	28 37 63.1	33.0	0.18	021491
18.5	.8780369	1082	4487224	6071	.1947184	6606	29 6 79.0	48.8	0.23	022070
19.0	.8739564	0310	4556216	5066	.1977119	6542	29 36 34.3	4.1	0.28	022647
19.5	.8698166	8904	4624875	3728	.2006909	6332	30 5 49.2	18.9	0.33	023224
20.0	+ .8656119	6870	+ 4693196	2054	+ .2036553	5977	30 34 63.5	33.1	- 0.37	023799
20.5	.8613447	4210	4761174	0036	.2066048	5473	31 3 77.4	46.9	0.41	024373
21.0	.8570151	0926	4828805	7671	.2095393	4819	31 33 30.7	0.2	0.45	024947
21.5	.8526235	7022	4896084	4954	.2124586	4013	32 2 43.5	12.9	0.47	025520
22.0	.8481704	2504	4963007	1881	.2153625	3053	32 31 55.7	25.1	0.49	026092
22.5	+ .8436561	7373	+ 5029570	8448	+ .2182809	2238	33 0 67.4	36.7	- 0.49	026663
23.0	.8390808	1633	5095767	4649	.2211234	0664	33 29 78.7	48.0	0.49	027234
23.5	.8344450	5287	5161595	0481	.2239800	9231	33 58 89.5	58.7	0.48	027803
24.0	.8297491	8341	5227050	5940	.2268204	7636	34 28 39.9	9.1	0.47	028372
24.5	.8249933	0795	5292128	1022	.2296446	5870	34 57 49.8	18.9	0.44	028940
25.0	+ .8201779	2654	+ 5356824	5723	+ .2324521	3956	35 26 59.2	28.2	- 0.41	029507
25.5	.8153033	3921	5421135	0038	.2352429	1865	35 55 68.2	37.1	0.38	030073
26.0	.8103700	4601	5485055	3963	.2380168	9606	36 24 76.7	45.6	0.34	030639
26.5	.8053782	4696	5548581	7494	.2407736	7175	36 53 84.8	53.6	0.29	031204
27.0	.8003282	4208	5611709	0627	.2435132	4573	37 23 32.5	1.3	0.23	031767
27.5	+ .7952205	3143	+ 5674435	3358	+ .2462354	1796	37 52 39.8	8.5	- 0.18	032330
28.0	.7900554	1505	5736754	5632	.2489400	8844	38 21 46.7	15.4	0.12	032891
28.5	.7848332	9295	5798662	7595	.2516268	5714	38 50 53.2	21.8	- 0.06	033451
29.0	.7795643	6519	5860154	5992	.2542955	2403	39 19 59.3	27.8	+ 0.01	034009
29.5	.7742191	3179	5921227	0170	.2569460	8910	39 48 65.1	33.5	0.08	034566
30.0	+ .7688277	9278	+ 5981876	0825	+ .2595781	5233	40 17 70.5	38.8	+ 0.15	035120
30.5	.7633807	4821	6042097	1051	.2621916	1370	40 46 75.6	43.9	0.22	035672
May 1.0	.7578783	9809	6101884	0844	.2647863	7319	41 15 80.3	48.5	0.29	036222
1.5	.7523210	4249	6161233	0199	.2673621	3079	41 44 84.6	52.8	0.36	036769
2.0	.7467091	8142	6220140	9912	.2699186	8646	42 13 88.5	56.6	0.42	037313
2.5	+ .7410431	1495	+ 6278602	7580	+ .2724558	4020	42 43 32.0	0.1	+ 0.48	037854

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
May 3.0	+7353234	4310	+6336614	5598	+2749734	9198	43 12 35.2	3.9	+0.53	0.0
3.5	7295503	6591	6394171	3161	2774713	4179	43 41 38.1	6.0	0.58	038391
4.0	7237243	8343	6451268	0264	2799491	8960	44 10 40.6	8.4	0.62	038926
4.5	7178458	9570	6507902	6904	2824068	3539	44 39 42.8	10.5	0.65	039457
5.0	7119153	10277	6564069	3078	2848442	7916	45 8 44.6	12.9	0.68	039985
5.5	+7059332	10468	+6619765	8780	+2872611	2087	45 37 46.1	13.6	+0.70	040508
6.0	6990000	10148	6674984	4006	2896573	6052	46 6 47.2	14.7	0.72	041028
6.5	6938161	9321	6729723	8751	2920326	9807	46 35 48.0	15.4	0.72	041543
7.0	6876818	7990	6783977	3012	2943868	3352	47 4 48.3	15.7	0.72	042054
7.5	6814977	6161	6837743	6785	2967198	6685	47 33 48.3	15.6	0.71	042561
8.0	+6752644	3840	+6891016	0065	+2990313	9803	48 2 47.9	15.2	+0.70	043063
8.5	6689823	1031	6943792	2848	3013213	2706	48 9 47.9	14.4	0.67	043560
9.0	6626518	7738	6996068	5131	3035895	5391	48 31 47.2	14.4	0.67	044052
9.5	6562735	3967	7047839	6909	3058357	7856	49 0 46.0	13.1	0.64	044540
10.0	6498478	9722	7099101	8178	3080599	0101	49 29 44.5	11.5	0.61	045023
10.5	+6433754	5010	+7149851	8935	+3102618	2123	49 58 42.6	9.5	0.57	045501
11.0	6363567	9835	7200084	9176	3124413	3921	50 27 40.3	7.1	+0.52	045974
11.5	6302923	4203	7249798	8898	3145982	5493	50 56 37.6	4.4	0.46	046442
12.0	6236827	8119	7298900	8098	3167325	6839	51 25 34.5	1.2	0.40	046905
12.5	6170284	1588	7347655	6771	3188439	7966	51 53 90.9	56.6	0.35	047364
13.0	+6103300	4616	+7395790	4914	+3200323	8844	52 22 87.0	53.6	0.29	047818
13.5	6035881	7209	7443392	2524	3229976	9500	52 51 82.6	49.1	+0.23	048267
14.0	5969031	9370	7490457	9697	3250396	9924	53 20 77.8	44.2	0.16	048712
14.5	5899756	1107	7536983	6131	3270580	0111	53 49 72.6	38.9	0.10	049152
15.0	5831062	2424	7582968	2125	3290532	0067	54 18 67.0	33.2	+0.04	049588
15.5	+5761953	3327	+7628408	7573	+3310947	9785	54 47 60.9	27.0	-0.02	050020
16.0	5692435	3820	7673300	2474	3329724	9266	55 16 54.4	20.4	-0.08	050448
16.5	5622513	3910	7717641	6824	3348961	8507	55 45 47.5	13.5	0.13	050871
17.0	5552193	3601	7761428	0620	3367958	7508	56 14 40.2	6.1	0.18	051291
17.5	5481480	2899	7804660	3861	3386715	6969	56 42 92.4	58.3	0.22	051707
18.0	+5410381	1811	+7847334	6544	+3406231	4789	57 11 84.3	50.1	0.26	052119
18.5	5338901	10342	7889448	8667	3423504	3066	57 40 75.7	41.4	-0.30	052527
19.0	5267044	8496	7930998	0226	3441532	1098	58 9 66.7	32.4	0.33	052933
19.5	5194814	6278	7971982	1219	3459315	8885	58 38 57.3	22.8	0.35	053335
20.0	5122217	3691	8012399	1645	3476853	6427	59 7 47.6	13.0	0.36	053735
20.5	+5049259	10744	+8062247	1502	+3494144	3722	59 36 37.4	2.7	0.36	054131
21.0	4975945	7440	8091522	0787	3511187	0770	60 4 87.0	52.2	-0.35	054524
21.5	4902280	3786	8130223	9498	3527981	7568	60 33 76.2	41.4	0.33	054915
22.0	4828271	9787	8168346	7631	3544525	4117	61 2 65.0	30.1	0.31	055303
22.5	4753922	5449	8205890	5185	3560819	0415	61 31 53.4	18.5	0.28	055689
23.0	+4679236	10773	+8242853	2158	+3576869	6460	62 0 41.6	6.6	0.25	056072
23.5	4604221	5769	8279232	8547	3592646	2251	62 28 89.3	54.9	-0.21	056452
24.0	4528879	10437	8315024	4349	3608181	7791	62 57 76.7	41.5	0.17	056829
24.5	4453218	4786	8350229	9564	3623461	3075	63 26 63.9	28.6	0.12	057204
25.0	4377241	8819	8384843	4189	3638484	8103	63 55 50.8	15.4	0.06	057577
25.5	+4300951	2539	+8418865	8221	+3653951	2874	64 24 37.4	1.9	-0.00	057946
26.0	4224355	5952	8452293	1651	3667761	7389	64 52 83.7	48.1	+0.06	058313
26.5	4147458	9065	8485125	4502	3682011	1643	65 21 69.8	34.2	0.13	058676
27.0	4070267	1893	8517358	6746	3696000	5637	65 50 55.6	19.9	0.20	059037
27.5	3992786	4412	8548990	8389	3709729	9371	66 19 41.2	5.4	0.27	059394
28.0	+3915020	6655	+8580018	9428	+3723197	2844	66 47 86.6	50.7	0.34	059749
28.5	3836975	8620	8610441	9862	3736402	6054	67 16 71.8	35.8	+0.41	060099
29.0	3758656	10310	8640255	9637	3749342	8999	67 45 56.8	20.7	0.48	060447
29.5	3680068	1731	8669459	8900	3762017	1679	68 14 41.5	5.3	0.54	060791
30.0	3601216	2888	8698051	7505	3774427	4094	68 43 26.0	49.7	0.60	061132
30.5	+3522105	3786	+8726030	5485	+3786571	6243	69 11 70.3	33.9	0.65	061469
31.0	3442742	4431	8753301	2868	3798445	8122	69 40 54.4	17.9	+0.70	061802
31.5	3363129	4827	8780132	9620	3810049	9731	70 9 38.3	1.8	0.74	062130
June 1.0	3283275	4981	8806252	5752	3821385	1072	70 37 82.1	45.5	0.77	062453
1.5	3203184	4899	8831749	1260	3832451	2143	71 6 65.7	29.0	0.80	062772
2.0	+3122261	4584	+8856621	6144	+3843244	2941	71 35 49.2	12.4	0.82	063086
							72 3 92.4	55.5	+0.84	063395

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
June	2.5	+3042313	4045	+8880866	0400	+3853764	3466	72 32 75.6	38.6	+0.85	063700
	3.0	2961545	3285	8904481	4027	3864012	3720	73 1 58.5	21.4	0.85	063999
	3.5	2880564	2313	8927465	7023	3873986	3699	73 30 41.4	4.2	0.84	064293
	4.0	2799375	1132	8949816	9386	3883684	3403	73 58 84.0	46.8	0.82	064581
	4.5	2717985	9750	8971532	1114	3893105	2829	74 27 66.5	20.2	0.80	064863
	5.0	+2636400	8173	+8992611	2206	+3902949	1979	74 56 48.7	11.4	+0.78	065139
	5.5	2554625	6406	9013051	2658	3911116	0851	75 24 90.8	53.4	0.74	065409
	6.0	2472668	4457	9032850	9470	3919704	9445	75 53 72.6	35.1	0.70	065673
	6.5	2390534	2331	9052007	1639	3928014	7760	76 22 54.3	16.7	0.66	065931
	7.0	2308230	0035	9070521	0166	3936044	5796	76 50 95.8	58.1	0.61	066182
	7.5	+2225762	7575	+9088391	8848	+3943795	3553	77 19 77.2	39.4	+0.55	066428
	8.0	2143135	4956	9105615	5285	3951265	1029	77 48 58.3	20.4	0.49	066667
	8.5	2060356	2185	9122191	1874	3958455	8225	78 17 39.2	1.2	0.43	066900
	9.0	1977432	9268	9138119	7816	3965363	5139	78 45 79.9	41.8	0.36	067126
	9.5	1894368	6804	9153398	3108	3971989	1771	79 14 60.5	22.3	0.30	067346
	10.0	+1811171	3022	+9168027	7751	+3978333	8121	79 43 40.8	2.6	+0.24	067560
	10.5	1727842	9707	9182005	1742	3984395	4189	80 11 80.9	42.6	0.18	067768
	11.0	1644405	6271	9195330	5081	3990174	9974	80 40 68.8	22.4	0.11	067970
	11.5	1560847	2720	9208002	7766	3995669	5475	81 9 40.5	2.0	+0.05	068166
	12.0	1477181	9061	9220022	9800	4000881	0694	81 37 80.0	41.4	-0.01	068356
12.5	+1293414	5301	+9231389	1180	+4005810	5629	82 6 59.3	20.6	-0.07	068540	
13.0	1209551	1445	9242102	1907	4010456	0282	82 34 98.4	59.6	0.12	068718	
13.5	1225599	7500	9252162	1981	4014819	4651	83 3 77.3	38.4	0.16	068892	
14.0	1141565	3472	9261567	1400	4018897	8736	83 32 55.9	16.9	0.20	069059	
14.5	1057454	9367	9270318	0165	4022693	2538	84 0 94.4	55.3	0.23	069222	
15.0	+0973272	5191	+9278415	8277	+4026904	6056	84 29 72.6	33.5	-0.25	069379	
15.5	0889027	0952	9285855	5734	4029433	9291	84 58 50.7	11.5	0.26	069531	
16.0	0804723	6654	9292645	2536	4032377	9242	85 26 88.5	49.2	0.27	069679	
16.5	0720367	2304	9298777	8682	4035039	4910	85 55 66.1	26.7	0.27	069823	
17.0	0635963	7906	9304254	4174	4037416	7294	86 24 43.5	4.0	0.26	069962	
17.5	+0551519	3468	+9309077	9011	+4039510	9395	86 52 80.8	41.2	-0.24	070097	
18.0	0467039	8994	9313246	3195	4041320	1212	87 21 57.8	18.1	0.22	070227	
18.5	0382528	4489	9316761	6724	4042846	2745	87 49 94.8	55.0	0.19	070353	
19.0	0297994	9960	9319621	9599	4044089	3995	88 18 71.5	31.6	0.16	070476	
19.5	0213441	5412	9321828	1821	4045049	4962	88 47 48.2	8.2	0.12	070595	
20.0	+0128875	0851	+9323381	3389	+4045724	5643	89 16 84.6	44.5	-0.07	070710	
20.5	+0044302	6253	93294281	4304	4046117	6043	89 44 61.0	20.8	-0.01	070822	
21.0	-0040272	8266	9334526	4564	4046225	6158	90 12 97.2	56.9	+0.04	070929	
21.5	0124812	2821	9339418	4171	4046051	5991	90 41 73.3	32.9	0.10	071033	
22.0	0209403	7408	93439057	4125	4045593	5540	91 10 49.4	8.9	0.16	071133	
22.5	-0003949	1949	+9341343	1426	+4044862	4806	91 38 85.4	44.8	+0.23	071230	
23.0	0378474	6470	9318976	9075	4043828	3789	92 7 61.3	20.6	0.30	071323	
23.5	0462974	0966	9315956	6070	4042521	2489	92 35 97.1	56.3	0.37	071413	
24.0	0547442	5431	9312284	2414	4040930	0905	93 4 72.9	32.0	0.44	071499	
24.5	0631875	9859	9307959	8104	4039057	9039	93 33 48.6	7.6	0.51	071582	
25.0	-0716265	4246	+9302963	3144	+4036900	6889	94 1 84.3	43.2	+0.57	071660	
25.5	0800607	8584	9297354	7530	4034461	4457	94 30 60.0	18.8	0.63	071735	
26.0	0884896	2869	9291074	1266	4031739	1742	94 58 95.7	54.4	0.68	071806	
26.5	0969125	7096	9284142	4356	4028735	8745	95 17 71.4	30.0	0.73	071873	
27.0	1053289	1257	9276558	6782	4025447	5464	95 56 47.2	5.7	0.78	071935	
27.5	-1137384	5349	+9268323	8563	+4021877	1901	96 24 83.0	41.4	+0.82	071993	
28.0	1221402	9364	9255437	9693	4018023	8054	96 53 58.8	17.1	0.86	072047	
28.5	1305338	3298	9249900	5172	4013887	3925	97 21 94.6	52.8	0.88	072096	
29.0	1389186	7144	9239713	5001	4009467	9512	97 50 70.4	28.6	0.90	072141	
29.5	1472940	0896	9228376	9180	4004765	4817	98 19 46.3	4.4	0.90	072181	
30.0	-1556594	4549	+9217389	7709	+3999780	9839	98 47 82.3	40.3	+0.90	072215	
30.5	1640142	8095	9205253	5589	3994513	4579	99 16 58.3	16.2	0.90	072244	
July	1.0	1723577	1529	9182468	2820	3989664	9037	99 44 94.3	52.1	0.89	072268
	1.5	1806886	4846	9179035	9403	3983133	3213	100 13 70.5	28.2	0.87	072287
	2.0	1890098	8038	9164954	5339	3977021	7108	100 42 46.7	4.3	0.84	072299
	2.5	-1973152	1102	+9150224	0625	+3970628	0722	101 10 82.9	40.4	+0.81	072306

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
July 3.0	—2056080	4029	+9134848	5266	+3963953	4655	101° 39' 59"	16.5	+0.77	072307
3.5	2138866	6815	.9118828	9262	.3956998	7107	102 7 95.5	52.8	0.72	072302
4.0	2221504	9452	.9102162	2612	.3949763	9890	102 36 71.9	29.2	0.67	072290
4.5	2303987	1935	.9084852	5318	.3942248	2372	103 5 48.4	5.6	0.62	072271
5.0	2386309	4258	.9066898	7381	.3934454	4585	103 33 84.9	42.0	0.56	072246
5.5	—2468465	6414	+9048302	8801	+3926381	6519	104 2 61.5	18.5	+0.50	072215
6.0	2550447	8397	.9029066	9582	.3918031	8176	104 30 98.2	55.1	0.43	072178
6.5	2632249	0199	.9009190	9722	.3909403	9555	104 59 75.0	31.8	0.37	072134
7.0	2713865	1816	.8988676	9225	.3900498	9658	105 28 51.8	8.5	0.30	072083
7.5	2795290	3241	.8967526	8092	.3891316	1483	105 56 88.6	45.2	0.23	072025
8.0	—2876516	4468	+8945741	6324	+3881859	3034	106 25 65.4	22.0	+0.17	071961
8.5	2957538	5491	.8923322	3922	.3872129	2311	106 53 102.3	58.8	0.11	071890
9.0	3038348	6302	.8900273	0890	.3862126	2316	107 22 79.2	35.7	0.05	071813
9.5	3118941	6896	.8876594	7227	.3851849	2046	107 51 56.1	12.5	+0.00	071729
10.0	3199311	7268	.8852237	2937	.3841299	1504	108 19 93.1	49.4	—0.05	071639
10.5	—3279452	7411	+8827355	8021	+3830478	0690	108 48 70.1	26.3	—0.09	071543
11.0	3359358	7319	.8801800	2483	.3819388	9608	109 17 47.0	3.1	0.13	071441
11.5	3439024	6987	.8775623	6323	.3808029	8256	109 45 84.0	40.0	0.16	071332
12.0	3518444	6409	.8748828	9545	.3796401	6636	110 14 61.0	16.9	0.18	071218
12.5	3597612	5579	.8721415	2149	.3784505	4747	110 42 98.1	53.9	0.20	071098
13.0	—3676525	4496	+8693389	4140	+3772343	2593	111 11 75.2	30.9	—0.22	070972
13.5	3755175	3148	.8664750	5518	.3759915	0173	111 40 52.8	7.9	0.22	070841
14.0	3833557	1533	.8635501	6296	.3747222	7488	112 8 89.5	45.1	0.21	070705
14.5	3911665	9644	.8605644	6445	.3734266	4540	112 37 66.7	22.2	0.21	070564
15.0	3989494	7476	.8575182	6000	.3721048	1330	113 5 103.9	59.3	0.20	070417
15.5	—4067038	5023	+8544116	4950	+3707567	7856	113 34 81.2	36.5	—0.18	070265
16.0	4144291	2280	.8512451	3302	.3693827	4124	114 3 58.5	13.7	0.14	070109
16.5	4221249	9241	.8480187	1054	.3679827	0131	114 31 96.9	51.0	0.10	069947
17.0	4297907	5903	.8447329	8213	.3665571	5883	115 0 73.3	28.3	0.06	069780
17.5	4374260	2260	.8413878	4779	.3651058	1377	115 29 50.7	5.6	—0.01	069612
18.0	—4450302	8307	+8379837	0755	+3636289	6616	115 57 88.2	43.1	+0.05	069438
18.5	4526028	4037	.8345208	6143	.3621265	1599	116 26 65.8	20.6	0.10	069261
19.0	4601434	9448	.8309095	0947	.3605989	6331	116 54 103.5	58.3	0.16	069080
19.5	4676515	4534	.8274199	5168	.3590458	0807	117 23 81.3	36.0	0.22	068896
20.0	4751267	9291	.8237824	8809	.3574678	5035	117 52 59.2	13.8	0.29	068707
20.5	—4825685	3714	+8200871	1873	+3558647	9011	118 20 97.2	51.7	+0.36	068515
21.0	4899764	7798	.8163344	4362	.3542366	2738	118 59 75.4	29.8	0.42	068320
21.5	4973500	1539	.8125244	6279	.3525836	6215	119 18 53.7	8.0	0.48	068121
22.0	5046886	4930	.8086574	7625	.3509059	9446	119 46 32.2	46.4	0.54	067919
22.5	5119916	7967	.8047336	8404	.3492036	2430	120 15 70.9	25.0	0.60	067714
23.0	—5192589	0646	+8007531	8615	+3474767	5169	120 44 49.7	3.8	+0.65	067505
23.5	5264898	2962	.7967164	8265	.3457254	7663	121 12 88.7	42.7	0.70	067293
24.0	5336839	4910	.7926237	7353	.3439497	9913	121 41 67.9	21.9	0.75	067077
24.5	5408407	6485	.7884752	5885	.3421498	1921	122 10 47.3	1.2	0.79	066858
25.0	5479594	7679	.7842713	3862	.3403259	3690	122 38 86.9	40.7	0.83	066636
25.5	—5550398	8480	+7800121	1287	+3384780	5218	123 7 66.8	20.5	+0.85	066410
26.0	5620814	8914	.7756086	8162	.3366060	6506	123 36 46.9	0.5	0.87	066180
26.5	5690637	8944	.7713291	4489	.3347103	7556	124 4 87.3	40.8	0.88	065947
27.0	5760460	8575	.7669058	0272	.3327908	8369	124 33 67.9	21.3	0.89	065710
27.5	5829680	7803	.7624282	5512	.3308478	8946	125 2 48.7	2.0	0.88	065469
28.0	—5898492	6623	+7578966	0212	+3288813	9289	125 30 89.7	43.0	+0.87	065224
28.5	5968891	5030	.7533112	4374	.3268915	9398	125 59 71.0	24.2	0.85	064974
29.0	6034871	3019	.7486724	8002	.3248784	9274	126 28 52.7	5.9	0.83	064720
29.5	6102428	0584	.7439804	1098	.3228342	8919	126 56 94.6	47.7	0.80	064460
30.0	6169556	7721	.7392354	3664	.3207831	8336	127 25 76.9	29.9	0.76	064197
30.5	—6236251	4425	+7344379	5705	+3187011	7523	127 54 59.4	12.8	+0.72	063929
31.0	6302507	0690	.7295881	6223	.3165964	6484	128 22 102.3	55.1	0.67	063655
31.5	6368320	6512	.7246864	8222	.3144691	5218	128 51 85.5	38.2	0.62	063376
Aug. 1.0	6433682	1883	.7197329	8703	.3123193	3728	129 20 68.9	21.6	0.55	063092
1.5	6499591	6802	.7147281	8671	.3101472	2014	129 49 52.6	5.2	0.49	062803
2.0	—6563037	1258	+7096724	8129	+3079530	0080	130 17 96.6	49.2	+0.42	062508

SUN'S COÖRDINATES, 1861. 387

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	0.0
Aug. 2.5	—6627019	5250	+7045661	7682	+3057367	7024	130 46	80.9	33.5	+0.35	062207
3.0	.6690531	5773	.6994094	5529	.3034987	5551	131 15	65.5	18.0	0.29	061901
3.5	.6753569	1821	.6942027	3478	.3012390	2961	131 44	50.4	2.8	0.22	061589
4.0	.6816127	4390	.6889464	0930	.2989578	50156	132 12	95.5	47.8	0.16	061271
4.5	.6878199	6472	.6836410	7892	.2966353	7138	132 41	81.0	33.2	0.10	060948
5.0	—6939780	8064	+6782368	4365	+2943316	3908	133 10	66.7	18.8	+0.04	060618
5.5	.7000865	9160	.6728841	0354	.2919869	0468	133 39	52.7	4.7	—0.02	060282
6.0	.7061451	9757	.6674333	5861	.2896215	6821	134 7	98.9	50.9	0.07	059941
6.5	.7121533	9850	.6619349	0893	.2872354	2967	134 36	85.4	37.3	0.10	059594
7.0	.7181106	9434	.6563894	5453	.2848288	8008	135 5	72.2	24.0	0.17	059241
7.5	—7240166	8506	+6507970	9544	+2824019	4646	135 34	59.3	11.0	—0.21	058882
8.0	.7298708	7060	.6451582	3170	.2799549	0183	136 2	106.6	58.3	0.25	058518
8.5	.7356728	5092	.6394734	6337	.2774880	5521	136 31	94.1	45.7	0.27	058148
9.0	.7414220	2596	.6337331	9049	.2750014	0661	137 0	81.8	33.3	0.29	057773
9.5	.7471181	9560	.6279677	1810	.2724952	5606	137 29	69.8	21.2	0.30	057393
10.0	—7527607	6007	+6221477	3124	+2689697	0357	137 58	58.1	9.4	—0.30	057007
10.5	.7583494	1906	.6162836	4498	.2674251	4917	138 26	106.7	57.9	0.29	056617
11.0	.7638336	7961	.6103758	5434	.2648615	9287	138 55	95.5	46.7	0.27	056221
11.5	.7693631	2069	.6044246	5937	.2622792	3470	139 24	84.5	35.6	0.25	055820
12.0	.7747875	6327	.5984306	6011	.2596783	7467	139 53	73.7	24.8	0.23	055415
12.5	—7801565	0029	+5923043	5663	+2570591	1281	140 22	63.2	14.2	—0.20	055006
13.0	.7854696	3176	.5863161	4895	.2544217	4913	140 51	52.9	3.9	0.16	054593
13.5	.7907265	5759	.5801964	3712	.2517664	8366	141 19	102.9	53.8	0.11	054176
14.0	.7959269	7777	.5740356	2118	.2490933	1641	141 48	93.1	43.9	0.06	053755
14.5	.8010704	9226	.5678342	0118	.2464026	4740	142 17	83.6	34.3	0.00	053331
15.0	—8061567	0103	+5615026	7715	+2436945	7665	142 46	74.3	25.0	+0.06	052903
15.5	.8111853	0403	.5553113	4916	.2409691	0417	143 15	65.4	16.0	0.12	052471
16.0	.8161560	0125	.5489908	1724	.2382268	3000	143 44	56.7	7.3	0.18	052037
16.5	.8210684	9264	.5426314	8143	.2354676	5414	144 12	108.3	58.8	0.25	051600
17.0	.8259223	7818	.5362336	4178	.2326918	7662	144 41	100.2	50.7	0.32	051160
17.5	—8307174	5784	+5297979	9834	+2298996	9746	145 10	92.3	42.7	+0.38	050717
18.0	.8354533	3158	.5233248	5114	.2270910	1665	145 39	84.8	35.2	0.44	050272
18.5	.8401296	9936	.5168145	0024	.2242663	3424	146 8	77.6	27.9	0.50	049825
19.0	.8447461	6117	.5102676	4567	.2214257	5024	146 27	70.7	20.9	0.55	049376
19.5	.8493025	1697	.5036846	8749	.2185694	6467	147 6	64.2	14.3	0.60	048924
20.0	—8537985	6673	+4970660	2575	+2156975	7754	147 35	58.0	8.1	+0.65	048470
20.5	.8582337	1041	.4904122	6049	.2128103	8888	148 4	52.2	2.2	0.69	048014
21.0	.8626079	4800	.4837243	9133	.2099079	9669	148 32	106.7	56.7	0.73	047557
21.5	.8669207	7954	.4770000	1951	.2069905	0701	149 1	101.6	51.5	0.75	047097
22.0	.8711718	0472	.4702425	4387	.2040583	1384	149 30	96.9	46.8	0.77	046636
22.5	—8753610	2380	+4634513	6496	+2011115	1922	149 59	92.6	42.4	+0.78	046172
23.0	.8794879	3666	.4566270	8253	.1981503	2315	150 28	88.6	38.4	0.79	045706
23.5	.8835521	4325	.4497700	9694	.1951748	2566	150 57	85.0	34.7	0.79	045237
24.0	.8875534	4355	.4428807	0812	.1921854	2677	151 26	82.0	31.6	0.79	044767
24.5	.8914914	3752	.4359595	1611	.1891821	2650	151 55	79.4	28.9	0.78	044294
25.0	—8953658	2514	+4290069	2095	+1861650	2484	152 24	77.4	26.9	+0.76	043819
25.5	.8991763	0636	.4220234	2271	.1831344	2184	152 53	75.7	25.1	0.73	043341
26.0	.9029225	8116	.4150093	2140	.1800906	1751	153 22	74.4	23.8	0.70	042861
26.5	.9066042	4951	.4079650	1707	.1770337	1188	153 51	73.6	22.9	0.65	042377
27.0	.9102210	1137	.4008912	0979	.1739639	0495	154 20	73.3	22.6	0.60	041892
27.5	—9137725	6670	+3937884	9961	+1708813	0674	154 49	73.5	22.7	+0.54	041404
28.0	.9172586	1550	.3866570	8656	.1677864	8730	155 17	74.1	23.3	0.48	040912
28.5	.9206787	5769	.3794970	7066	.1646791	7662	155 47	75.2	24.3	0.42	040417
29.0	.9240330	9331	.3723103	5208	.1615598	6474	156 16	76.8	25.8	0.35	039919
29.5	.9273208	2227	.3650960	3075	.1584289	5170	156 45	78.9	27.8	0.29	039418
30.0	—9305417	4455	+3578550	0674	+1552864	3750	157 14	81.4	30.3	+0.22	038913
30.5	.9336054	6011	.3508878	8012	.1521326	2217	157 43	84.4	33.2	0.15	038404
31.0	.9367818	6894	.3432950	5093	.1489677	0572	158 12	87.9	36.7	0.09	037892
31.5	.9398804	7099	.3359791	1923	.1457919	8819	158 41	91.9	40.6	+0.03	037375
Sept. 1.0	.9427512	6626	.3286346	8507	.1426055	6959	159 10	96.3	45.0	—0.04	036855
1.5	.9456339	5472	+3212681	4851	+1394086	4995	159 39	101.2	49.8	—0.10	036330

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
Sept. 2.0	—9484479	3631	+3138782	0960	+1368016	2029	160° 8' 106.6	55.2	—0.16	035809
2.5	9511932	1103	3064654	6841	1329847	0764	160 38 58.5	1.0	0.21	035269
3.0	9538696	7886	2990302	2497	1297582	8503	161 7 58.8	7.3	0.26	034733
3.5	9564765	3975	2915731	7934	1265221	6146	161 36 65.5	13.9	0.31	034192
4.0	9590142	9372	2840949	3160	1232768	3697	162 5 72.6	21.0	0.35	033648
4.5	—9614824	4073	+2765960	8179	+1200226	1158	162 34 80.2	28.5	—0.38	033099
5.0	9638806	8075	2690769	2096	1167596	8533	163 3 88.3	36.6	0.40	032547
5.5	9662088	1377	2615384	7619	1134882	5823	163 38 96.8	45.0	0.41	031990
6.0	9684666	3975	2539909	2051	1102088	3033	164 1 105.7	53.9	0.41	031430
6.5	9706539	5868	2464060	6899	1069214	0163	164 31 55.1	3.2	0.41	030866
7.0	—9727703	7052	+2388113	0368	+1036264	7217	165 0 64.8	12.9	—0.40	030298
7.5	9748158	7527	2312004	4966	1003239	4196	165 29 75.0	23.0	0.38	029726
8.0	9767902	7201	2235730	7998	0970143	1103	165 58 85.6	33.6	0.35	029151
8.5	9786934	6343	2159206	1571	0936977	7941	166 27 96.6	44.5	0.32	028573
9.0	9805252	4681	2082708	4989	0903744	4711	166 56 107.9	55.8	0.29	027991
9.5	—9822856	2305	+2005972	8259	+0870447	1418	167 26 59.7	7.5	—0.25	027407
10.0	9839745	9215	1929003	1386	0837089	8063	167 55 71.8	19.6	0.20	026819
10.5	9855918	5408	1852077	4376	0803672	4650	168 24 84.4	32.1	0.15	026230
11.0	9871374	0885	1774929	7234	0770199	1180	168 53 97.3	45.0	0.09	025638
11.5	9886113	5644	1697656	9966	0736671	7655	169 22 110.7	58.3	—0.03	025044
12.0	—9900131	9683	+1620263	2577	+0703092	4079	169 52 64.4	12.0	+0.04	024448
12.5	9913430	3004	1542756	5075	0669462	0452	170 21 78.6	26.1	0.10	023850
13.0	9926007	5600	1465140	7464	0636785	6778	170 50 93.1	40.6	0.17	023251
13.5	9937863	7477	1387420	9749	0604062	3058	171 19 108.1	55.5	0.24	022650
14.0	9948996	8630	1309603	1936	0568297	9896	171 49 63.4	10.8	0.30	022048
14.5	—9969404	9060	+1231603	4030	+0534492	5404	172 18 79.3	26.6	+0.36	021445
15.0	9969089	8766	1153698	6039	0500650	1655	172 47 95.5	42.8	0.42	020841
15.5	9978050	7748	1075822	7867	0466772	7780	173 16 112.2	59.4	0.47	020236
16.0	9986284	6003	0997470	9819	0433862	3872	173 46 69.2	16.4	0.52	019631
16.5	9993793	3532	0919248	1600	0398922	9895	174 15 86.8	34.0	0.56	019026
17.0	—1.0000576	0338	+0840962	3316	+0364953	5968	174 44 104.7	51.8	+0.60	018421
17.5	1.0006633	6416	0762617	4974	0330957	1975	175 14 63.0	10.3	0.63	017816
18.0	1.0011962	1767	0684217	6577	0296938	7968	175 43 82.0	29.0	0.65	017211
18.5	1.0016565	6392	0606767	8130	0262897	3919	176 19 101.3	48.2	0.67	016606
19.0	1.0020438	0287	0527274	9640	0228837	9861	176 42 61.2	8.1	0.68	016001
19.5	—1.0023583	3454	+0448741	1110	+0194769	5785	177 11 81.5	28.3	+0.68	015396
20.0	1.0025998	5891	0370176	2548	0160667	1605	177 40 102.4	49.2	0.67	014791
20.5	1.0027683	7598	0291583	3958	0126562	7502	178 10 63.8	10.5	0.66	014186
21.0	1.0028635	8572	0212869	5346	0092448	3479	178 39 85.7	32.4	0.64	013581
21.5	1.0028856	8815	0134338	6719	0058326	9359	179 8 108.1	54.7	0.61	012976
22.0	—1.0028346	8326	+0055696	8077	+0024198	5232	179 38 71.0	17.6	+0.58	012371
22.5	1.0027101	7104	—0022953	0670	—0009933	8998	180 7 94.5	41.0	0.54	011766
23.0	1.0025124	5150	0101604	9220	0044064	3028	180 37 58.5	5.0	0.49	011161
23.5	1.0022414	2462	0180251	7865	0078193	7156	181 6 83.1	29.5	0.43	010556
24.0	1.0018970	9041	0258887	6500	0112318	1280	181 36 108.2	54.6	0.37	009951
24.5	—1.0014792	4885	—0337507	5119	—0146537	5498	182 5 74.0	20.3	+0.31	009346
25.0	1.0009879	9995	0416105	3716	0180547	9507	182 34 100.3	46.6	0.25	008741
25.5	1.0004231	4369	0494675	2285	0214645	2604	183 4 67.2	13.4	0.19	008135
26.0	9997848	8009	0573213	0823	0248720	7687	183 33 94.7	40.9	0.12	007529
26.5	9990729	0912	0651712	9321	0282797	1754	184 3 62.7	8.8	+0.05	006923
27.0	—9982875	3081	—0730167	7776	—0316846	5803	184 32 91.3	37.4	—0.02	006317
27.5	9974284	4512	0808573	6182	0350873	9830	185 2 60.5	6.5	0.09	005709
28.0	9964958	5209	0886923	4533	0384875	3832	185 31 90.2	36.2	0.15	005101
28.5	9954894	5167	0965211	2821	0418850	7807	186 1 63.5	6.4	0.21	004491
29.0	9944094	4390	1043431	1042	0452795	1752	186 30 91.4	37.3	0.27	003880
29.5	—9932357	2875	—1121577	9189	—0486709	5666	187 0 62.8	8.6	—0.33	003267
30.0	9920284	0625	1199643	7255	0520587	9544	187 30 94.9	40.6	0.38	002653
30.5	9907275	7638	1277623	5236	0554427	3384	187 59 67.4	13.1	0.42	002037
Oct. 1.0	9893531	3917	1355511	3127	0588226	7184	188 28 100.5	46.2	0.46	001420
1.5	9879052	9461	1433300	0917	0621983	0941	188 58 74.2	19.8	0.49	000801
2.0	—9863839	4270	—1510984	8604	—0655694	4653	189 27 108.4	54.0	—0.53	000181

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SUN'S COÖRDINATES, 1861. 389

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	Y.	Z.	X.	Y.	Z.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	
Oct. 2.5	—9847890	8345	—1588557	6179	—0689366	8316	189° 57' 83.2	28.7	—0.53	99558	
3.0	9831209	1686	1666013	3637	0722967	1928	190 27 58.5	4.0	0.54	996934	
3.5	9813796	4296	1743346	0972	0756525	5487	190 56 94.3	39.7	0.53	998308	
4.0	9795652	6174	1820549	8177	0790025	8988	191 26 70.7	16.1	0.52	997681	
4.5	9776779	7324	1876716	5246	0823466	2430	191 55 107.5	52.8	0.51	997053	
5.0	—9757176	7743	—1974541	2174	—0866845	5810	192 25 84.9	30.2	—0.49	996423	
5.5	9736847	7437	2061318	8054	0890160	9126	192 55 62.8	8.0	0.46	995792	
6.0	9715790	6403	2127941	5578	0923407	2374	193 24 101.1	46.3	0.42	995160	
6.5	9694008	4644	2204404	2045	0956584	5553	193 54 79.9	25.0	0.38	994526	
7.0	9671504	2163	2280699	8347	0989688	8658	194 24 59.1	4.2	0.34	993892	
7.5	—9648279	8961	—2356821	4473	—1022718	1689	194 53 96.9	43.9	—0.29	993256	
8.0	9624336	5041	2432705	0421	1055669	4642	195 23 79.0	24.0	0.23	992620	
8.5	9599675	0403	2508525	6185	1088541	7516	195 53 59.7	4.6	0.18	991984	
9.0	9574301	5051	2584094	1758	1121330	0307	196 22 100.7	45.6	0.12	991348	
9.5	9548213	8987	2659468	7136	1154033	3012	196 52 82.3	27.1	—0.05	990711	
10.0	—9521416	2213	—2734640	2313	—1186648	5629	197 22 64.2	9.0	+0.01	990074	
10.5	9493909	4729	2809606	7933	1219174	8157	197 51 106.7	51.4	0.07	989437	
11.0	9465697	6539	2884357	2039	1251608	0503	198 21 89.5	34.2	0.13	988801	
11.5	9436779	7644	2968889	6576	1283948	2935	198 51 72.8	17.4	0.20	988165	
12.0	9407160	8047	3033197	0800	1316189	5178	199 21 56.5	1.1	0.26	987530	
12.5	—9376842	7752	—3107275	4973	—1348331	7322	199 50 100.7	45.2	+0.31	986896	
13.0	9345826	6758	3181118	8821	1380371	9365	200 20 85.2	29.7	0.36	986264	
13.5	9314115	5070	3254721	2430	1412308	1304	200 50 70.3	14.7	0.40	985633	
14.0	9281711	2688	3329080	5795	1444138	3137	201 20 55.7	0.1	0.44	985004	
14.5	9248615	9615	3401180	8910	1475860	4861	201 49 101.7	46.0	0.47	984377	
15.0	—9214832	5854	—3474042	1769	—1507472	6476	202 19 88.1	32.4	+0.50	983752	
15.5	9180362	1407	3546634	4867	1538972	7978	202 49 75.0	19.2	0.51	983129	
16.0	9145210	6277	3618969	6699	1570356	9365	203 19 62.4	6.6	0.52	982508	
16.5	9109376	0466	3691011	8758	1601623	0634	203 48 110.3	54.4	0.52	981890	
17.0	9072865	3977	3762786	0641	1632771	1785	204 18 98.5	42.6	0.52	981274	
17.5	—9035676	6810	—3834278	2040	—1663798	2815	204 48 87.3	31.3	+0.51	980661	
18.0	8997816	8972	3905484	3253	1694699	3719	205 18 76.5	20.5	0.49	980051	
18.5	8959284	0462	3976400	4176	1725474	4497	205 48 66.2	10.1	0.47	979444	
19.0	8920084	1284	4047019	4803	1756119	5146	206 18 56.4	0.3	0.44	978839	
19.5	8880217	1439	4117338	5130	1786633	5663	206 47 107.1	50.9	0.40	978238	
20.0	—8839637	0931	—4187350	5150	—1817014	6048	207 17 98.3	42.1	+0.35	977639	
20.5	8798495	9761	4257050	4858	1847260	6387	207 47 90.1	33.8	0.30	977044	
21.0	8756645	7933	4326433	4249	1877368	6409	208 17 82.4	26.1	0.24	976451	
21.5	8714138	5448	4395493	3317	1907337	6381	208 47 75.3	18.9	0.18	975861	
22.0	8670978	2310	4464226	2069	1937163	6211	209 17 68.7	12.2	0.11	975274	
22.5	—8627166	8520	—4532627	0463	—1966846	5898	209 47 62.6	6.0	+0.04	974690	
23.0	8582706	4081	4600639	8539	1996383	5439	210 17 57.1	0.5	—0.03	974108	
23.5	8537600	8997	4668409	6863	2025772	4832	210 46 112.1	55.4	0.10	973529	
24.0	8491850	3268	4735780	3648	2055010	4075	211 16 107.7	51.0	0.17	972953	
24.5	8345459	6899	4802798	0675	2084095	3164	211 46 103.8	47.0	0.24	972379	
25.0	—8396430	9891	—4869457	7343	—2113024	2098	212 16 100.5	43.7	—0.31	971807	
25.5	8350766	2249	4935752	3648	2141795	0873	212 46 97.8	40.9	0.37	971237	
26.0	8302468	3072	5001690	9586	2170405	9488	213 16 95.6	38.7	0.43	970669	
26.5	8253541	5066	5067231	5147	2198853	7941	213 46 93.9	36.9	0.49	970103	
27.0	8203986	5539	5132402	0330	2227135	6228	214 16 92.8	35.7	0.54	969539	
27.5	—8153809	5376	—5197188	5126	—2255850	4348	214 46 92.2	35.0	—0.59	968976	
28.0	8103012	4600	5261584	9532	2283195	2298	215 16 92.2	35.0	0.63	968416	
28.5	8051598	3207	5325583	3541	2310968	0075	215 46 92.7	35.4	0.66	967857	
29.0	7999573	1202	5389182	7151	2338566	7678	216 16 93.8	36.5	0.69	967300	
29.5	7946939	8589	5458374	0354	2366968	5106	216 46 95.4	38.0	0.71	966743	
30.0	—7893699	5369	—5515154	3145	—2395230	2354	217 16 97.5	40.1	—0.72	966189	
30.5	7839659	1550	5577517	5520	2423290	9419	217 46 100.2	42.7	0.72	965635	
31.0	7785420	7131	5639456	7471	2447166	6301	218 16 103.3	45.8	0.72	965083	
31.5	7730386	2119	5700968	8995	2473857	2997	218 46 106.9	49.3	0.71	964531	
Nov. 1.0	7674762	6514	5769047	0088	2500359	9605	219 16 111.0	53.3	0.69	963982	
1.5	—7618552	0325	—5822687	0740	—2528671	5822	219 46 115.6	57.8	—0.67	963432	

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	δ
Nov. 2.0	—7561760	3553	—5882885	0951	—2552790	1947	220° 17'	60.7	2.9	—0.64	962885
2.5	7504391	6104	5942634	0712	2578715	7878	220 47	66.3	8.4	0.60	962338
3.0	7446450	8283	6001928	0819	2604442	3611	221 17	72.3	14.4	0.55	961793
3.5	7387939	9892	6060764	8867	2629969	9144	221 47	78.7	20.7	0.50	961248
4.0	7328867	10740	6119136	7252	2655295	4476	222 17	85.5	27.5	0.45	960706
4.5	7269235	1128	—6177039	5168	—2680418	5065	222 47	92.8	34.7	—0.50	960164
5.0	7210049	10962	6234468	2610	2705335	4528	223 17	100.4	42.2	0.34	959624
5.5	7148314	10247	6291420	9586	2730045	9244	223 47	108.5	50.2	0.28	959085
6.0	7087034	8087	6347889	6059	2754544	3749	224 17	116.9	58.5	0.22	958549
6.5	7025215	7188	6403870	2054	2778832	8043	224 48	65.8	7.3	0.15	958015
7.0	6962861	4853	—6459360	7558	—2802906	2123	225 18	75.0	16.5	—0.09	957483
7.5	6899979	11991	6514355	2567	2826765	5988	225 48	84.6	26.0	—0.03	956953
8.0	6836571	8602	6568850	7076	2850408	9638	226 18	94.5	35.9	+0.03	956426
8.5	6772645	4696	6622840	1080	2873832	3068	226 48	104.8	46.1	0.09	955901
9.0	6708204	10274	6676322	4576	2897036	6279	227 18	115.5	56.8	0.14	955380
9.5	6643256	5345	—6729291	7559	—2920018	9267	227 49	66.5	7.7	+0.18	954861
10.0	6577801	9909	6781744	0027	2942776	2032	228 19	77.8	18.9	0.22	954346
10.5	6511848	3975	6833677	1975	2965309	4571	228 49	89.5	30.5	0.26	953833
11.0	6445402	7548	6885085	3400	2987615	6884	229 19	101.5	42.4	0.29	953325
11.5	6378467	10631	6936066	4296	3009693	8869	229 49	113.8	54.6	0.31	952820
12.0	6311048	3231	—6986316	4662	—3031540	9823	230 20	66.5	7.3	+0.33	952320
12.5	6243150	5352	7036131	4492	3053156	2446	230 50	79.6	20.3	0.33	951824
13.0	6174779	6999	7085408	3785	3074539	3536	231 20	93.0	33.7	0.32	951332
13.5	6105939	8178	7134142	2535	3095685	4990	231 50	106.7	47.3	0.31	950845
14.0	6036638	8806	7182332	0741	3116596	5909	232 21	60.8	1.3	0.30	950363
14.5	5966377	9150	—7229973	8398	—3137269	6589	232 51	75.2	15.6	+0.28	949886
15.0	5896665	8958	7277061	5502	3157703	7031	233 21	90.0	30.3	0.24	949414
15.5	5826604	8315	7323594	2052	3177896	7231	233 51	105.2	45.4	0.20	948947
16.0	5754899	7228	7369568	8043	3197847	7190	234 22	69.7	0.8	0.16	948486
16.5	5683356	5703	7414980	3472	3217554	6905	234 52	76.6	16.6	0.11	948030
17.0	5611379	3744	—7459826	8335	—3237017	6376	235 22	92.9	32.9	+0.05	947580
17.5	5538974	1357	7504103	2629	3256233	5600	235 52	109.6	49.5	—0.01	947134
18.0	5466145	8546	7547808	6351	3275200	4576	236 23	66.7	6.6	0.07	946695
18.5	5392899	5318	7590937	9497	3293918	3302	236 53	84.1	23.9	0.13	946260
19.0	5319237	1673	7633436	2063	3312384	1777	237 23	101.9	41.6	0.20	945831
19.5	5245168	7621	—7674451	4047	—3330597	9908	237 53	120.1	59.7	—0.27	945407
20.0	5170695	3165	7716830	5444	3348556	7966	238 24	78.7	18.2	0.34	944988
20.5	5095826	8312	7757620	2652	3366259	5678	238 54	97.7	37.1	0.41	944574
21.0	5020564	3066	7797817	6469	3383704	3132	239 24	117.1	56.4	0.47	944166
21.5	4944915	7433	7837418	6088	3400890	0326	239 55	76.9	16.1	0.54	943762
22.0	4868885	1419	—7876421	5110	—3417817	7263	240 25	97.1	36.3	—0.60	943365
22.5	4792478	6028	7914822	3529	3434483	3938	240 55	117.8	56.9	0.66	942972
23.0	4715699	8265	7952616	1342	3450885	0350	241 26	78.8	17.9	0.71	942584
23.5	4638554	1136	7989801	8546	3467022	6496	241 56	100.2	39.2	0.75	942201
24.0	4561048	3645	8026374	5138	3482893	2377	242 27	62.0	0.9	0.80	941822
24.5	4483186	5798	—8062331	1114	—3498496	7989	242 57	84.3	23.1	—0.84	941448
25.0	4404976	7603	8097668	6471	3513831	3334	243 27	106.9	45.6	0.87	941079
25.5	4326423	9065	8132381	1204	3528895	8407	243 58	70.0	8.6	0.89	940713
26.0	4247533	10189	8166469	5313	3543686	3208	244 28	93.4	31.9	0.90	940352
26.5	4168312	10982	8199928	8792	3558204	7735	244 58	117.2	55.6	0.90	939994
27.0	4088766	11450	—8232755	1639	—3572448	1989	245 29	81.4	19.8	—0.90	939641
27.5	4008900	11598	8264946	3850	3586414	5964	245 59	105.9	44.2	0.89	939291
28.0	3928720	11432	8296497	5421	3600106	9666	246 30	70.8	9.1	0.88	938945
28.5	3848233	10959	8327408	6352	3613518	3088	247 0	86.1	34.3	0.85	938602
29.0	3767445	10185	8357674	6639	3626649	6229	247 30	121.7	59.8	0.82	938263
29.5	3686361	9115	—8387293	6279	—3639499	9089	248 1	87.6	25.6	—0.79	937926
30.0	3604990	7757	8416262	5269	3652067	1667	248 31	113.9	51.8	0.75	937594
30.5	3523336	6116	8444578	3606	3664352	3062	249 2	80.5	18.3	0.70	937264
Dec. 1.0	3441409	4201	8472239	1287	3676351	5971	249 32	107.4	45.1	0.64	936938
1.5	3359213	2018	8499240	8310	3688065	7635	250 3	74.6	12.2	0.59	936615
2.0	3276757	9574	—8525580	4671	—3699492	9132	250 33	102.0	39.6	—0.53	936295

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .	δ
Dec. 2.5	—3194046	6875	—8551258	0371	—3710631	0981	251° 4' 69.7	7.2	—0.47	935978	8.9
3.0	3111069	3930	8576271	5405	3721480	1140	251 34 97.6	35.0	0.41	935665	
3.5	3027891	0744	8600617	9773	3732040	1710	252 5 65.8	3.1	0.35	935355	
4.0	2944459	7324	8624294	3472	3742309	1989	252 35 94.2	31.4	0.28	935049	
4.5	2860798	3675	8647300	6500	3752288	1978	253 6 62.8	0.0	0.22	934746	
5.0	—2776920	9808	—8669634	8867	—3761975	1676	253 36 91.6	28.6	—0.16	934448	
5.5	2692828	5727	8691294	0639	3771370	1081	254 6 120.6	57.5	0.10	934153	
6.0	2608530	1440	8712277	1545	3780472	0194	254 37 89.8	26.6	0.05	933863	
6.5	2524032	6953	8732553	1873	3789281	9013	255 8 119.2	55.9	—0.00	933576	
7.0	2439342	2874	8752210	1623	3797794	7637	255 38 88.7	26.4	+0.05	933294	
7.5	—2354465	7408	—8771157	0492	—3806013	5766	256 8 118.4	55.0	+0.09	933017	
8.0	2269410	2363	8789422	8780	3813936	3700	256 30 88.2	24.7	0.12	932744	
8.5	2184182	7144	8807003	6384	3821564	1339	257 9 118.2	54.6	0.15	932475	
9.0	2098790	1763	8823899	3303	3828894	8679	257 40 88.3	24.6	0.17	932213	
9.5	2013238	6221	8840110	9537	3835927	5722	258 10 118.5	54.7	0.18	931955	
10.0	—1927534	0526	—8855633	5084	—3842663	2469	258 41 88.9	25.0	+0.18	931702	
10.5	1841683	4634	8870470	0944	3849101	8918	259 11 119.4	55.4	0.17	931455	
11.0	1755695	8704	8884619	4117	3855242	5070	259 42 90.1	26.0	0.15	931213	
11.5	1669574	2592	8898080	7601	3861085	0924	260 12 120.8	56.6	0.13	930977	
12.0	1583328	6354	8910852	0397	3866628	6477	260 43 91.7	27.5	0.11	930747	
12.5	—1496962	9996	—8922035	2504	—3871872	1732	261 13 122.7	58.4	+0.08	930523	
13.0	1410485	3528	8934337	3920	3876816	6687	261 44 93.8	29.4	+0.04	930306	
13.5	1323901	6852	8945027	4644	3881461	1343	262 15 65.0	0.5	—0.00	930095	
14.0	1237218	0277	8955035	4676	3885806	5699	262 45 96.4	31.8	0.05	929890	
14.5	1150441	3508	8964351	4016	3889851	9755	263 16 67.9	3.2	0.11	929693	
15.0	—1063576	6651	—8972974	2664	—3893596	3511	263 46 90.5	34.7	—0.18	929502	
15.5	0976630	9712	8980904	0618	3897041	6967	264 17 71.2	6.3	0.24	929318	
16.0	0886910	2698	8988140	7879	3900184	0121	264 47 103.1	38.1	0.31	929141	
16.5	0802521	5616	8994632	4446	3903025	2074	265 18 75.1	10.0	0.37	928972	
17.0	0715370	8471	9000529	0319	3905564	5523	265 48 107.3	42.1	0.44	928809	
17.5	—0628163	1271	—9005680	5495	—3907801	7771	266 19 79.6	14.3	—0.50	928654	
18.0	0540906	4020	9010134	0974	3909737	9718	266 49 112.1	46.7	0.57	928505	
18.5	0453605	6725	9013891	3756	3911371	1363	267 20 84.7	19.2	0.63	928363	
19.0	0366269	9395	9016950	6840	3912701	2705	267 50 117.5	51.9	0.69	928228	
19.5	0278901	2032	9019312	9227	3913729	3744	268 21 90.4	24.7	0.75	928100	
20.0	—0191510	4646	—9020976	0916	—3914453	4480	268 51 123.5	57.7	—0.80	927978	
20.5	0104101	7242	9021941	1906	3914875	4913	269 22 96.8	30.9	0.85	927863	
21.0	—0016680	9625	—9022206	2197	—3914992	5042	269 53 70.2	4.2	0.90	927754	
21.5	+0070747	7598	9021772	1789	3914805	4866	270 23 103.8	37.7	0.93	927652	
22.0	0158171	5018	9020639	0681	3914315	4388	270 54 77.5	11.3	0.96	927556	
22.5	+0245587	2430	9018806	8874	3913520	3604	271 24 111.4	45.1	—0.98	927466	
23.0	0332968	9628	9016272	6366	3912421	2517	271 55 85.5	19.1	0.99	927382	
23.5	0420367	7203	9013037	3157	3911017	1124	272 25 119.7	53.2	0.99	927304	
24.0	0507716	4549	9009103	9249	3909309	9428	272 56 94.1	27.5	0.99	927232	
24.5	0595030	1860	9004468	4640	3907297	7427	273 27 68.6	1.9	0.99	927165	
25.0	+0632300	9127	8999131	9329	3904980	5122	273 47 103.2	36.4	—0.98	927105	
25.5	0769522	6347	8993093	3317	3902358	2511	274 28 77.9	11.0	0.96	927050	
26.0	0856687	3510	8986354	6605	3899432	9597	274 58 112.8	45.9	0.94	926999	
26.5	0943790	0611	8978913	9190	3896202	6378	275 29 87.8	20.8	0.90	926953	
27.0	1030622	7642	8970771	1074	3892667	2855	275 59 122.9	56.8	0.86	926912	
27.5	+1117777	4596	8961928	2257	3888827	9026	276 30 98.1	30.9	—0.81	926876	
28.0	1204648	1466	8952385	2740	3884684	4895	277 1 73.4	6.1	0.76	926844	
28.5	1291427	8244	8942142	2523	3880237	0459	277 31 108.8	41.4	0.70	926817	
29.0	1378108	4924	8931200	1608	3875486	5720	278 2 84.2	16.7	0.64	926794	
29.5	1464682	1497	8919559	9993	3870432	0677	278 32 119.7	52.1	0.58	926775	
30.0	+1551144	7960	8907220	7681	3865075	5332	279 3 95.2	27.5	—0.52	926761	
30.5	1637487	4301	8894185	4672	3859415	9683	279 34 70.8	3.0	0.46	926751	
31.0	1723703	0517	8880454	0968	3853453	3733	280 4 106.4	36.6	0.40	926745	
31.5	1809784	6598	8866028	6568	3847190	7481	280 35 82.1	14.2	0.34	926743	
32.0	+1895724	2536	8850908	1475	3840624	0929	281 5 117.8	49.8	—0.28	926745	

392 HELIOCENTRIC COÖRDINATES.

MERCURY.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{y^2}{r^3}y$.	$-\frac{z^2}{r^3}z$.
780	-0.2719	-0.3690	-0.0068	9.6612	233 40.0	+2.75	+ 3.73	+0.07
785	0.1776	0.4299	0.0204	9.6680	247 41.4	1.71	4.14	0.20
790	-0.0704	0.4595	0.0324	9.6684	261 29.1	+0.68	4.43	0.31
795	+0.0419	0.4555	0.0422	9.6622	275 28.1	-0.41	4.47	0.41
800	0.1510	0.4169	0.0486	9.6494	290 4.7	1.66	4.57	0.53
805	0.2473	0.3437	0.0511	9.6296	305 49.1	3.11	4.32	0.64
810	0.3199	0.2379	0.0486	9.6038	323 18.5	4.81	3.57	0.72
815	0.3558	-0.1055	0.0407	9.5721	343 18.1	6.65	+ 1.97	0.76
820	0.3414	+0.0409	0.0270	9.5377	6 37.5	8.09	- 0.97	0.64
825	0.2666	0.1792	-0.0067	9.5068	33 48.9	7.83	5.25	+0.26
830	+0.1342	0.2775	+0.0114	9.4892	64 19.3	-4.45	9.20	-0.38
835	-0.0306	0.3080	0.0287	9.4926	95 52.7	+0.99	9.98	0.93
840	0.1887	0.2651	0.0392	9.5154	125 31.2	5.22	7.33	1.08
845	0.3088	0.1669	0.0416	9.5483	151 30.3	6.81	3.68	0.92
850	0.3783	+0.0403	0.0372	9.5824	173 42.9	6.59	- 0.70	0.65
855	0.3983	-0.0923	0.0278	9.6125	192 50.8	5.64	+ 1.31	0.39
860	0.3755	0.2154	0.0154	9.6366	209 43.3	4.50	2.58	0.18
865	0.3184	0.3192	+0.0015	9.6540	225 3.2	3.38	3.39	-0.02
870	0.2357	0.3974	-0.0125	9.6648	239 25.1	2.36	3.92	+0.12
875	0.1352	0.4459	0.0255	9.6690	253 17.9	1.29	4.27	0.94
880	-0.0250	0.4620	0.0367	9.6666	267 7.1	+0.24	4.50	0.37
885	+0.0871	0.4440	0.0452	9.6578	281 18.0	-0.90	4.59	0.47
890	0.1922	0.3912	0.0501	9.6422	296 18.2	2.21	4.51	0.58
895	0.2803	0.3044	0.0507	9.6200	312 40.3	3.77	4.09	0.68
900	0.3397	0.1868	0.0461	9.5915	331 4.8	5.56	3.06	0.75
905	0.3568	-0.0468	0.0358	9.5582	352 19.8	7.35	+ 0.96	0.74
910	0.3185	+0.0997	0.0200	9.5242	17 12.0	8.30	- 2.59	0.52
915	0.2188	0.2257	-0.0005	9.4975	45 53.9	6.86	7.06	+0.02
920	+0.0690	0.2991	+0.0190	9.4879	77 11.4	-2.31	10.00	-0.64
925	-0.0977	0.2988	0.0339	9.5000	108 17.5	+3.01	9.20	1.05
930	0.2431	0.2303	0.0411	9.5282	136 33.2	6.15	5.83	1.04
935	0.3434	+0.1175	0.0406	9.5624	160 57.1	6.87	- 2.35	0.81
940	0.3921	-0.0139	0.0339	9.5953	181 48.7	6.25	+ 0.22	0.54
945	0.3937	0.1441	0.0230	9.6231	199 55.8	5.18	1.90	0.30
950	0.3550	0.2602	+0.0098	9.6445	216 6.0	4.04	2.95	-0.11
955	0.2875	0.3542	-0.0042	9.6592	230 58.5	2.94	3.63	+0.04
960	0.1965	0.4208	0.0179	9.6673	245 5.4	1.91	4.07	0.17
965	-0.0912	0.4564	0.0303	9.6688	258 53.7	+0.88	4.38	0.29
970	+0.0208	0.4589	0.0405	9.6638	272 48.7	-0.21	4.55	0.40
975	0.1311	0.4268	0.0477	9.6523	287 16.1	1.41	4.59	0.51
980	0.2307	0.3599	0.0509	9.6340	302 45.2	2.81	4.39	0.62
985	0.3086	0.2600	0.0495	9.6091	319 51.7	4.47	3.77	0.72
990	0.3525	-0.1319	0.0426	9.5784	339 19.4	6.31	+ 2.36	0.76
995	0.3485	+0.0133	0.0300	9.5441	1 57.9	7.91	- 0.30	0.68
1000	0.2853	0.1552	-0.0124	9.5119	28 25.5	8.09	4.41	+0.25
1005	0.1626	0.2636	+0.0077	9.4910	58 25.9	5.32	8.63	-0.25
1010	+0.0010	0.3082	0.0259	9.4903	90 1.5	-0.03	10.14	0.85
1015	-0.1612	0.2781	0.0378	9.5101	120 12.8	+4.62	7.98	1.09
1020	0.2899	0.1883	0.0418	9.5418	146 55.9	6.68	4.34	0.96
1025	0.3693	+0.0651	0.0385	9.5762	169 48.6	6.71	- 1.18	0.70
1030	-0.3980	-0.0678	+0.0298	9.6073	189 27.3	+5.83	+ 0.99	-0.44

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 393

MERCURY.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{xy}{r^3}y$.	$-\frac{xz}{r^3}z$.
1035	-0.3825	-0.1935	+0.0178	9.6326	206 41.6	+4.71	+ 2.38	-0.22
1040	0.3313	0.3015	+0.0042	9.6513	222 16.0	3.59	3.27	-0.05
1045	0.2528	0.3849	-0.0099	9.6633	236 46.5	2.52	3.84	+0.10
1050	0.1551	0.4391	0.0232	9.6687	250 42.7	1.49	4.22	0.22
1055	-0.0460	0.4615	0.0348	9.6676	264 30.7	+0.44	4.47	0.34
1060	+0.0663	0.4501	0.0439	9.6599	278 35.6	-0.68	4.59	0.45
1065	0.1735	0.4037	0.0495	9.6457	293 24.2	1.95	4.54	0.56
1070	0.2657	0.3231	0.0510	9.6247	309 28.2	3.45	4.21	0.66
1075	0.3313	0.2110	0.0474	9.5973	327 26.3	5.21	3.31	0.74
1080	0.3575	-0.0741	0.0382	9.5647	348 5.4	7.03	+ 1.46	0.75
1085	0.3304	+0.0728	0.0234	9.5303	12 14.2	8.24	- 1.82	0.58
1090	0.2420	0.2052	-0.0043	9.5015	40 15.3	7.36	6.25	+0.13
1095	+0.0996	0.2906	+0.0156	9.4880	71 14.2	-3.33	9.73	-0.52
1100	-0.0670	0.3046	0.0317	9.4962	102 36.6	+2.12	9.62	1.00
1105	0.2189	0.2474	0.0404	9.5221	131 32.2	5.78	6.53	1.07
1110	0.3284	0.1408	0.0412	9.5559	156 39.7	6.87	2.94	0.86
1115	0.3968	+0.0112	0.0355	9.5894	178 7.8	6.41	- 0.19	0.59
1120	0.3967	-0.1304	0.0253	9.6183	196 42.0	5.40	+ 1.64	0.34
1125	0.3656	0.2409	+0.0124	9.6410	213 10.8	4.25	2.79	-0.14
1130	0.3023	0.3386	-0.0016	9.6569	228 15.4	3.15	3.52	+0.02
1135	0.2149	0.4106	0.0154	9.6663	242 28.7	2.11	4.01	0.15
1140	-0.1117	-0.4520	-0.0282	9.6690	256 18.5	+1.07	+ 4.33	+0.27

VENUS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{xy}{r^3}y$.	$-\frac{xz}{r^3}z$.
780	-0.6312	-0.3499	+0.0310	9.8586	208 57.0	+20.34	+11.18	-1.00
785	0.5767	0.4351	0.0267	9.8591	216 58.9	18.53	13.98	0.86
790	0.5112	0.5118	0.0217	9.8595	224 59.7	16.38	16.40	0.70
795	0.4357	0.5785	0.0163	9.8600	232 59.4	13.92	18.47	0.52
800	0.3516	0.6349	0.0106	9.8604	240 58.2	11.20	20.19	0.33
805	0.2607	0.6772	+0.0048	9.8607	248 56.2	8.28	21.52	-0.15
810	0.1648	0.7073	-0.0010	9.8611	256 53.4	5.22	22.42	+0.03
815	-0.0658	0.7238	0.0070	9.8614	264 49.8	+ 2.08	22.89	0.22
820	+0.0345	0.7263	0.0129	9.8616	272 45.5	- 1.09	22.92	0.41
825	0.1342	0.7149	0.0184	9.8619	280 40.8	4.23	22.53	0.58
830	0.2313	0.6899	0.0235	9.8620	288 35.6	7.29	21.72	0.73
835	0.3239	0.6516	0.0283	9.8622	296 30.0	10.19	20.49	0.89
840	0.4104	0.6008	0.0326	9.8623	304 24.2	12.90	18.88	1.03
845	0.4891	0.5385	0.0361	9.8623	312 18.4	15.37	16.92	1.14
850	0.5583	0.4658	0.0390	9.8623	320 12.6	17.55	14.64	1.23
855	0.6168	0.3842	0.0412	9.8621	328 6.9	19.40	12.08	1.30
860	0.6636	0.2954	0.0425	9.8620	336 1.5	20.90	9.30	1.34
865	0.6977	0.2010	0.0430	9.8618	343 56.5	22.01	6.34	1.36
870	0.7184	0.1026	0.0428	9.8616	351 51.8	22.70	3.24	1.35
875	0.7253	-0.0022	0.0417	9.8612	359 47.9	22.97	+ 0.07	1.32
880	0.7182	+0.0981	0.0398	9.8609	7 44.7	22.80	- 3.12	1.26
885	+0.6972	+0.1965	-0.0372	9.8605	15 42.2	-22.19	- 6.25	+1.18

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

394 HELIOCENTRIC COÖRDINATES.

VENUS.								
Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$.	$-\frac{xy}{r^3}$.	$-\frac{yz}{r^3}$.
890	+0.6627	+0.2912	-0.0338	9.9602	23 40.6	-21.14	- 9.29	+1.08
895	0.6154	0.3802	0.0297	9.8598	31 39.9	19.68	12.16	0.95
900	0.5561	0.4618	0.0250	9.8594	39 40.1	17.84	14.81	0.80
905	0.4859	0.5345	0.0198	9.8589	47 41.3	15.64	17.20	0.64
910	0.4062	0.5967	0.0143	9.8585	55 43.4	13.12	19.26	0.46
915	0.3185	0.6471	0.0085	9.8581	63 46.4	10.31	20.94	0.27
920	0.2245	0.6848	-0.0026	9.8577	71 50.2	7.28	22.22	+0.08
925	0.1262	0.7089	+0.0033	9.8574	79 54.8	4.11	23.05	-0.11
930	+0.0255	0.7190	0.0093	9.8571	88 0.0	-0.83	23.42	0.30
935	-0.0758	0.7150	0.0150	9.8569	96 5.9	+2.48	23.33	0.49
940	0.1757	0.6969	0.0204	9.8566	104 12.4	5.75	22.77	0.67
945	0.2721	0.6649	0.0255	9.8565	112 19.2	8.90	21.75	0.83
950	0.3631	0.6194	0.0301	9.8564	120 26.3	11.87	20.28	0.98
955	0.4467	0.5616	0.0341	9.8564	128 33.4	14.62	18.39	1.12
960	0.5214	0.4927	0.0374	9.8564	136 40.8	17.07	16.13	1.23
965	0.5859	0.4140	0.0399	9.8565	144 48.2	19.17	13.54	1.31
970	0.6387	0.3271	0.0416	9.8566	152 55.2	20.88	10.69	1.36
975	0.6787	0.2336	0.0424	9.8568	161 1.4	22.16	7.63	1.39
980	0.7053	0.1355	0.0424	9.8570	169 7.0	23.00	4.42	1.38
985	0.7179	+0.0347	0.0417	9.8573	177 12.3	23.36	- 1.13	1.36
990	0.7164	-0.0667	0.0401	9.8576	185 17.0	23.26	+ 2.17	1.30
995	0.7006	0.1668	0.0377	9.8580	193 21.0	22.70	5.41	1.22
1000	0.6710	0.2636	0.0345	9.8583	201 24.2	21.68	8.52	1.12
1005	0.6282	0.3553	0.0307	9.8588	209 26.5	20.23	11.44	0.99
1010	0.5731	0.4400	0.0264	9.8592	217 27.9	18.40	14.13	0.85
1015	0.5070	0.5161	0.0214	9.8596	225 28.4	16.24	16.53	0.69
1020	0.4309	0.5822	0.0161	9.8600	233 28.0	13.76	18.59	0.51
1025	0.3463	0.6370	0.0104	9.8604	241 26.8	11.03	20.28	0.33
1030	0.2551	0.6794	+0.0045	9.8607	249 24.7	8.11	21.59	-0.14
1035	0.1589	0.7087	-0.0015	9.8611	257 21.8	5.04	22.48	+0.04
1040	-0.0597	0.7243	0.0073	9.8614	265 18.2	+1.89	22.91	0.23
1045	+0.0406	0.7259	0.0130	9.8617	273 14.0	-1.28	22.91	0.41
1050	0.1401	0.7137	0.0186	9.8619	281 9.2	4.42	22.49	0.59
1055	0.2370	0.6879	0.0239	9.8621	289 4.0	7.46	21.65	0.75
1060	0.3293	0.6488	0.0287	9.8622	296 58.4	10.36	20.40	0.90
1065	0.4154	0.5972	0.0328	9.8623	304 52.6	13.06	18.77	1.02
1070	0.4935	0.5343	0.0363	9.8623	312 46.8	15.51	16.79	1.14
1075	0.5621	0.4611	0.0392	9.8622	320 41.0	17.68	14.50	1.24
1080	0.6200	0.3791	0.0413	9.8622	328 35.3	19.51	11.93	1.30
1085	0.6661	0.2898	0.0426	9.8620	336 29.8	20.98	9.13	1.34
1090	0.6994	0.1950	0.0431	9.8618	344 24.9	22.06	6.15	1.36
1095	0.7192	-0.0966	0.0427	9.8615	352 20.4	22.73	+ 3.05	1.35
1100	0.7252	+0.0037	0.0415	9.8612	0 16.5	22.97	- 0.12	1.31
1105	0.7172	0.1040	0.0396	9.8609	8 13.3	22.76	3.30	1.25
1110	0.6953	0.2023	0.0369	9.8605	16 10.9	22.13	6.44	1.17
1115	0.6601	0.2968	0.0334	9.8601	24 9.4	21.06	9.47	1.07
1120	0.6121	0.3854	0.0293	9.8597	32 8.7	19.59	12.34	0.94
1125	0.5521	0.4665	0.0247	9.8593	40 9.0	17.72	14.97	0.79
1130	0.4813	0.5385	0.0196	9.8589	48 10.2	15.49	17.33	0.63
1135	0.4011	0.6001	0.0141	9.8585	56 12.4	12.94	19.36	0.45
1140	+0.3130	+0.6497	-0.0081	9.8581	64 15.4	-10.13	-21.02	+0.26

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 395

THE EARTH.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{y^2}{r^3}y$.	$-\frac{z^2}{r^3}z$.
780	-0.2443	+0.9525	0.0000	9.9927	104 23.1	+ 3.43	-13.36	0.00
790	0.4092	0.8946		9.9929	114 34.6	5.74	12.54	
800	0.5612	0.8091		9.9933	124 45.0	7.85	11.30	
810	0.6961	0.6986		9.9939	134 53.9	9.70	9.79	
820	0.8004	0.5665		9.9947	145 1.1	11.21	7.85	
830	0.8980	0.4170		9.9957	155 5.6	12.35	5.72	
840	0.9593	0.2549		9.9968	165 7.2	13.09	3.47	
850	0.9916	+0.0850		9.9980	175 6.0	13.41	- 1.14	
860	0.9943	-0.0674		9.9992	185 1.0	13.32	+ 1.18	
870	0.9675	0.2572		0.0004	194 52.6	12.85	3.43	
880	0.9121	0.4194		0.0017	204 41.3	12.02	5.54	
890	0.8301	0.5694		0.0028	214 26.4	10.86	7.46	
900	0.7242	0.7029		0.0039	224 8.3	9.40	9.14	
910	0.5974	0.8161		0.0049	233 47.8	7.70	10.53	
920	0.4535	0.9062		0.0057	243 24.7	5.81	11.63	
930	0.2969	0.9704		0.0064	252 59.6	3.78	12.39	
940	-0.1317	1.0073		0.0069	262 33.2	+ 1.67	12.82	
950	+0.0371	1.0160		0.0071	272 5.5	- 0.48	12.90	
960	0.2049	0.9960		0.0072	281 37.5	2.61	12.64	
970	0.3670	0.9480		0.0071	291 9.7	4.67	12.04	
980	0.5187	0.8733		0.0068	300 42.3	6.61	11.11	
990	0.6557	0.7741		0.0063	310 16.0	8.39	9.88	
1000	0.7743	0.6530		0.0055	319 51.6	9.95	8.37	
1010	0.8708	0.5133		0.0047	329 29.0	11.25	6.62	
1020	0.9425	0.3590		0.0037	339 9.0	12.26	4.66	
1030	0.9869	0.1944		0.0026	348 51.9	12.94	2.54	
1040	1.0029	-0.0241		0.0014	358 37.7	13.25	+ 0.30	
1050	0.9895	+0.1470		0.0001	8 27.0	13.19	- 1.97	
1060	0.9469	0.3137		9.9989	18 19.8	12.73	4.23	
1070	0.8761	0.4709		9.9976	28 15.6	11.88	6.40	
1080	0.7790	0.6141		9.9965	38 15.0	10.64	8.40	
1090	0.6584	0.7389		9.9954	48 17.5	9.06	10.18	
1100	0.5178	0.8409		9.9945	58 22.5	7.17	11.66	
1110	0.3613	0.9171		9.9938	68 30.1	5.02	12.78	
1120	0.1936	0.9651		9.9932	78 39.6	2.70	13.50	
1130	+0.0200	0.9834		9.9928	88 50.2	- 0.28	13.79	
1140	-0.1543	+0.9716	0.0000	9.9927	99 1.7	+ 2.18	-13.63	0.00

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{y^2}{r^3}y$.	$-\frac{z^2}{r^3}z$.
780	+1.1057	+0.9498	-0.0064	0.1637	40 39.4	-0.63	-0.54	0.00
790	1.0155	1.0629	-0.0017	0.1673	46 18.6	0.56	0.59	0.00
800	0.9155	1.1662	+0.0028	0.1710	51 52.0	0.50	0.63	0.00
810	0.8074	1.2588	0.0075	0.1748	57 19.8	0.43	0.66	0.00
820	0.6921	1.3404	0.0120	0.1786	62 41.9	0.35	0.69	-0.01
830	0.5708	1.4105	0.0164	0.1823	67 58.5	0.27	0.70	0.01
840	+0.4448	+1.4687	+0.0207	0.1860	73 9.7	-0.20	-0.72	-0.01

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

396 HELIOCENTRIC COÖRDINATES.

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{y^2}{r^2}y$.	$-\frac{z^2}{r^2}z$.
850	+0.3151	+1.5148	+0.0249	0.1896	78 15.8	-0.15	-0.72	-0.01
860	0.1829	1.5489	0.0288	0.1931	83 16.8	0.08	0.72	0.01
870	+0.0492	1.5708	0.0325	0.1964	88 13.2	-0.02	0.71	0.01
880	-0.0848	1.5809	0.0359	0.1996	93 5.2	+0.04	0.70	0.02
890	0.2182	1.5791	0.0391	0.2027	97 53.0	0.09	0.69	0.02
900	0.3500	1.5659	0.0420	0.2055	102 36.9	0.15	0.67	0.02
910	0.4793	1.5414	0.0446	0.2081	107 17.2	0.20	0.65	0.02
920	0.6052	1.5062	0.0469	0.2106	111 54.4	0.25	0.62	0.02
930	0.7270	1.4605	0.0489	0.2128	116 28.6	0.30	0.59	0.02
940	0.8439	1.4048	0.0505	0.2147	121 0.1	0.34	0.56	0.02
950	0.9550	1.3398	0.0518	0.2165	125 29.4	0.38	0.54	0.02
960	1.0599	1.2658	0.0528	0.2180	129 56.6	0.42	0.50	0.02
970	1.1578	1.1836	0.0534	0.2192	134 22.2	0.45	0.46	0.02
980	1.2481	1.0937	0.0536	0.2202	138 46.4	0.49	0.42	0.02
990	1.3304	0.9967	0.0535	0.2209	143 9.6	0.51	0.38	0.02
1000	1.4042	0.8932	0.0531	0.2214	147 32.0	0.54	0.34	0.02
1010	1.4688	0.7841	0.0523	0.2217	151 54.0	0.56	0.30	0.02
1020	1.5242	0.6699	0.0512	0.2216	156 15.9	0.58	0.26	0.02
1030	1.5698	0.5515	0.0498	0.2213	160 37.9	0.60	0.21	0.02
1040	1.6053	0.4295	0.0480	0.2208	165 0.5	0.61	0.16	0.02
1050	1.6305	0.3047	0.0459	0.2200	169 24.0	0.63	0.11	0.02
1060	1.6452	0.1780	0.0436	0.2189	173 48.5	0.64	0.07	0.02
1070	1.6491	+0.0501	0.0410	0.2176	178 14.6	0.65	-0.02	0.02
1080	1.6422	-0.0781	0.0381	0.2160	182 42.3	0.66	+0.03	0.02
1090	1.6243	0.2057	0.0349	0.2142	187 12.2	0.66	0.08	0.01
1100	1.5955	0.3320	0.0315	0.2122	191 44.5	0.65	0.13	0.01
1110	1.5558	0.4561	0.0278	0.2099	196 19.4	0.65	0.19	0.01
1120	1.5053	0.5770	0.0240	0.2074	200 57.4	0.64	0.24	0.01
1130	1.4442	0.6937	0.0200	0.2047	205 38.8	0.62	0.30	0.01
1140	-1.3726	-0.8055	+0.0159	0.2018	210 22.7	+0.60	+0.35	-0.01

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{y^2}{r^2}y$.	$-\frac{z^2}{r^2}z$.
780	-4.03920	+3.49848	+0.07892	0.72788	139 6 38	+119.57	-103.56	-2.34
790	4.08903	3.44458	0.08024	0.72812	139 53 49	120.85	101.80	2.37
800	4.13806	3.39002	0.08154	0.72835	140 40 56	122.10	100.03	2.41
810	4.18629	3.33480	0.08282	0.72858	141 28 0	123.33	98.24	2.44
820	4.23371	3.27894	0.08409	0.72881	142 15 1	124.53	96.44	2.48
830	4.28032	3.22245	0.08535	0.72904	143 2 0	125.70	94.63	2.51
840	4.32611	3.16533	0.08659	0.72926	143 48 55	126.85	92.81	2.54
850	4.37107	3.10761	0.08781	0.72948	144 35 48	127.97	90.98	2.57
860	4.41519	3.04929	0.08902	0.72970	145 22 38	129.07	89.14	2.60
870	4.45846	2.99038	0.09021	0.72991	146 9 25	130.14	87.29	2.63
880	4.50087	2.93090	0.09138	0.73012	146 56 9	131.19	85.43	2.66
890	4.54242	2.87087	0.09253	0.73033	147 42 50	132.21	83.56	2.69
900	4.58311	2.81029	0.09366	0.73054	148 29 30	133.20	81.68	2.72
910	-4.62293	+2.74917	+0.09478	0.73074	149 16 6	+134.17	-79.79	-2.75

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 397

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
920	-4.66188	+2.68753	+0.09568	0.73094	150° 2' 40"	+135.11	-77.89	-2.78
930	4.69994	2.62538	0.09696	0.73114	150 49 11	136.03	75.99	2.81
940	4.73711	2.56273	0.09803	0.73133	151 35 39	136.92	74.08	2.83
950	4.77338	2.49960	0.09908	0.73152	152 22 6	137.79	72.16	2.86
960	4.80874	2.43600	0.10010	0.73171	153 8 29	138.63	70.23	2.89
970	4.84320	2.37195	0.10110	0.73189	153 54 51	139.45	68.30	2.91
980	4.87674	2.30744	0.10209	0.73207	154 41 10	140.24	66.36	2.94
990	4.90937	2.24249	0.10306	0.73225	155 27 27	141.01	64.41	2.96
1000	4.94108	2.17711	0.10401	0.73243	156 13 41	141.75	62.46	2.98
1010	4.97186	2.11132	0.10494	0.73260	156 59 53	142.46	60.50	3.00
1020	5.00170	2.04514	0.10585	0.73277	157 46 3	143.15	58.53	3.03
1030	5.03061	1.97858	0.10674	0.73294	158 32 11	143.81	56.56	3.05
1040	5.05858	1.91165	0.10761	0.73310	159 18 17	144.44	54.59	3.07
1050	5.08560	1.84436	0.10846	0.73326	160 4 21	145.05	52.61	3.09
1060	5.11167	1.77673	0.10929	0.73342	160 50 23	145.64	50.62	3.11
1070	5.13678	1.70876	0.11010	0.73357	161 36 23	146.20	48.63	3.13
1080	5.16094	1.64048	0.11089	0.73372	162 22 21	146.74	46.64	3.15
1090	5.18413	1.57189	0.11166	0.73387	163 8 17	147.25	44.65	3.17
1100	5.20635	1.50300	0.11240	0.73401	163 54 11	147.73	42.65	3.19
1110	5.22761	1.43383	0.11313	0.73415	164 40 4	148.19	40.65	3.21
1120	5.24790	1.36439	0.11384	0.73428	165 25 55	148.62	38.64	3.22
1130	5.26722	1.29471	0.11452	0.73442	166 11 44	149.03	36.63	3.24
1140	-5.28557	+1.22479	+0.11518	0.73455	166 57 31	+149.42	-34.62	-3.26

SATURN.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	-8.36824	+4.02697	+0.26922	0.96804	154° 19' 45"	+14.11	-6.79	-0.45
790	8.39534	3.97651	0.27115	0.96818	154 40 55	14.14	6.70	0.46
800	8.42213	3.92591	0.27306	0.96831	155 2 5	14.17	6.61	0.46
810	8.44800	3.87516	0.27496	0.96844	155 23 14	14.21	6.52	0.46
820	8.47415	3.82427	0.27686	0.96857	155 44 22	14.24	6.43	0.47
830	8.50059	3.77324	0.27874	0.96870	156 5 29	14.27	6.33	0.47
840	8.52611	3.72207	0.28061	0.96883	156 26 36	14.30	6.24	0.47
850	8.55131	3.67076	0.28247	0.96896	156 47 42	14.32	6.15	0.47
860	8.57620	3.61932	0.28432	0.96909	157 8 47	14.35	6.06	0.48
870	8.60077	3.56775	0.28616	0.96922	157 29 51	14.38	5.97	0.48
880	8.62503	3.51604	0.28799	0.96935	157 50 55	14.41	5.88	0.48
890	8.64897	3.46420	0.28981	0.96949	158 11 58	14.43	5.78	0.48
900	8.67259	3.41224	0.29162	0.96962	158 33 0	14.46	5.69	0.49
910	8.69590	3.36015	0.29342	0.96975	158 54 1	14.49	5.60	0.49
920	8.71889	3.30794	0.29521	0.96988	159 15 2	14.51	5.51	0.49
930	8.74156	3.25560	0.29699	0.97001	159 36 1	14.54	5.42	0.49
940	8.76391	3.20315	0.29876	0.97015	159 57 0	14.56	5.32	0.50
950	8.78593	3.15058	0.30052	0.97028	160 17 58	14.58	5.23	0.50
960	8.80763	3.09790	0.30226	0.97041	160 38 55	14.61	5.14	0.50
970	8.82900	3.04510	0.30399	0.97055	160 59 51	14.63	5.05	0.50
980	-8.85005	+2.99220	+0.30571	0.97068	161 20 47	+14.65	-4.95	-0.51

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

398 HELIOCENTRIC COÖRDINATES.

SATURN.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
990	-8.87078	+2.93919	+0.30742	0.97082	161° 41' 42"	+14.67	-4.86	-0.51
1000	8.89118	2.88607	0.30912	0.97095	162° 2' 36"	14.69	4.77	0.51
1010	8.91126	2.83284	0.31081	0.97109	162° 23' 29"	14.71	4.68	0.51
1020	8.93101	2.77951	0.31249	0.97122	162° 44' 22"	14.73	4.58	0.51
1030	8.95044	2.72608	0.31416	0.97136	163° 5' 14"	14.75	4.49	0.52
1040	8.96954	2.67255	0.31581	0.97149	163° 26' 5"	14.77	4.40	0.52
1050	8.98831	2.61892	0.31746	0.97162	163° 46' 55"	14.78	4.31	0.52
1060	9.00676	2.56520	0.31909	0.97176	164° 7' 45"	14.80	4.22	0.52
1070	9.02488	2.51138	0.32071	0.97190	164° 28' 33"	14.81	4.12	0.53
1080	9.04268	2.45748	0.32232	0.97203	164° 49' 21"	14.83	4.03	0.53
1090	9.06015	2.40349	0.32391	0.97217	165° 10' 8"	14.85	3.94	0.53
1100	9.07730	2.34941	0.32550	0.97230	165° 30' 54"	14.86	3.85	0.53
1110	9.09411	2.29524	0.32707	0.97243	165° 51' 39"	14.87	3.75	0.53
1120	9.11060	2.24099	0.32863	0.97257	166° 12' 24"	14.89	3.66	0.54
1130	9.12676	2.18667	0.33018	0.97270	166° 33' 8"	14.90	3.57	0.54
1140	-9.14259	+2.13226	+0.33172	0.97284	166° 53' 52"	+14.91	-3.48	-0.54

URANUS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
800	+6.41231	+18.18675	-0.01201	1.28520	70° 34' 41"	-0.17	-0.48	0.00
840	6.26197	18.23100	0.00991	1.28503	71° 2' 36"	0.17	0.48	0.00
880	6.11125	18.27404	0.00780	1.28486	71° 30' 31"	0.16	0.49	0.00
920	5.96011	18.31584	0.00567	1.28468	71° 58' 29"	0.16	0.49	0.00
960	5.80862	18.35650	0.00354	1.28451	72° 26' 27"	0.15	0.49	0.00
1000	5.65676	18.39580	-0.00140	1.28434	72° 54' 26"	0.15	0.49	0.00
1040	5.50451	18.43390	+0.00073	1.28416	73° 22' 26"	0.13	0.49	0.00
1080	5.35192	18.47079	0.00285	1.28399	73° 50' 28"	0.14	0.49	0.00
1120	+5.19899	+18.50644	+0.00498	1.28382	74° 18' 31"	-0.14	-0.50	0.00

NEPTUNE.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
800	+29.8553	-0.6658	-0.6960	1.47524	358° 44.0	-0.28	+0.01	+0.01
840	29.8565	0.5396	0.6986	1.47523	358° 58.5	0.28	+0.01	0.01
880	29.8574	0.4140	0.7012	1.47521	359° 13.0	0.28	0.00	0.01
920	29.8579	0.2878	0.7037	1.47520	359° 27.5	0.28	0.00	0.01
960	29.8578	0.1619	0.7063	1.47519	359° 42.0	0.28	0.00	0.01
1000	29.8578	-0.0360	0.7088	1.47517	359° 56.5	0.28	0.00	0.01
1040	29.8561	+0.0900	0.7113	1.47516	0° 11.0	0.28	0.00	0.01
1080	29.8545	0.2167	0.7138	1.47514	0° 25.6	0.28	0.00	0.01
1120	+29.8523	+0.3409	-0.7162	1.47513	0° 40.0	-0.28	0.00	+0.01

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 18.

HELIOCENTRIC COÖRDINATES. 399

INCLINATIONS AND NODES.

Planets.	Inclination.	Increase in 100 Days.	Longitude of Ascending Node.	Increase in 100 Days.
Mercury	° ' " 7 0 8.8	" +0.01952	° ' " 46 39 20	" 11.639
Venus	3 23 36.3	+0.01195	75 25 35	9.001
Mars	1 51 2.1	—0.00586	48 27 42	7.579
Jupiter	1 18 39.5	—0.05689	99 1 38	9.993
Saturn	2 29 21.2	—0.03824	112 24 8	8.570
Uranus	0 46 29.8	+0.00634	73 16 44	4.898
Neptune	1 46 29.0		130 12 8	

LOGARITHMS OF MASSES.

Sun's = 1.

Mercury, 93.3129	The Earth, 94.44985	Jupiter, 96.979689	Uranus, 95.60371
Venus, 94.4089	Mars, 93.57176	Saturn, 96.45573	Neptune, 95.72630

ECLIPSES IN 1861.

In the year 1861 there will be four Eclipses; three of the Sun and one of the Moon, and a transit of Mercury over the Sun's disc.

I. An Annular Eclipse of the Sun, January 10, 1861, invisible at Washington, with the following elements:—

Washington Mean Time of δ in Right Ascension, January 10^d 10^h 16^m 4.6^s.

Sun's and Moon's R.A.	19 ^h 30 ^m 40.91 ^s	Hourly Motions	10.85 and 137.15
Sun's Declination	—21° 49' 19.1"	Hourly Motion	+ 0' 23.5"
Moon's Declination	—21° 59' 38.2"	" "	+ 7' 59.3"
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 15.9
Moon's Equa. Hor. Par.	56 47.0	" "	15 27.6

From these elements may be deduced the following results:—

Eclipse begins on the Earth, January 10^d 7^h 27^m.1, Washington mean time, in longitude 207° 51'.8 West from Washington, and in latitude 19° 32'.4 South.

Central Eclipse begins 8^h 30^m.7, in longitude 225° 19'.2 West from Washington, and in latitude 22° 56'.2 South.

Central Eclipse at noon, 10^h 16^m.1, in longitude 151° 58'.3 West from Washington, and in latitude 32° 30'.1 South.

Central Eclipse ends 12^h 11^m.8, in longitude 92° 33'.0, West from Washington, and in latitude 4° 7'.6 North.

Eclipse ends on the Earth 13^h 15^m.5, in longitude 109° 50'.2 West from Washington, and in latitude 7° 34'.2 North.

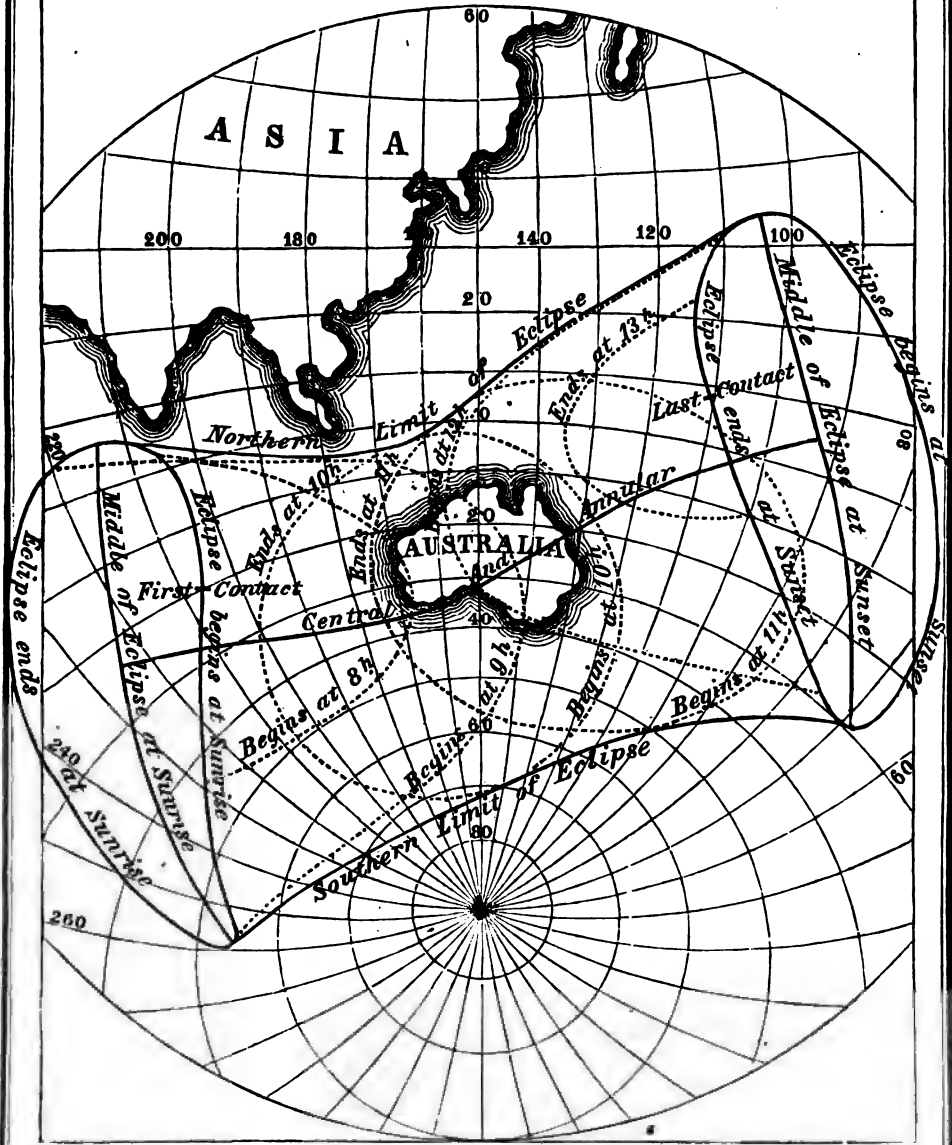
DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	—9.57	—9.56	
7 25	—1.47417	—0.00351	—1.12291	6828	8483	5667	5362	109° 12' 40.0
7 30	1.43108	+0.00761	1.11182	6829	8485	5658	5352	110 27 39.2
7 35	1.38799	0.01873	1.10073	6830	8486	5649	5342	111 42 38.3
7 40	1.34490	0.02985	1.08964	6832	8487	5639	5332	112 57 37.5
7 45	1.30181	0.04097	1.07855	6834	8489	5629	5322	114 12 36.7
7 50	1.25872	0.05209	1.06746	6835	8490	5620	5313	115 27 35.8
7 55	1.21563	0.06321	1.05636	6837	8492	5610	5303	116 42 35.0
8 0	1.17255	0.07434	1.04526	6839	8494	5600	5293	117 57 34.2
8 5	1.12946	0.08547	1.03416	6840	8495	5591	5283	119 12 33.3
8 10	1.08637	0.09660	1.02306	6841	8496	5582	5273	120 27 32.5
8 15	1.04328	0.10773	1.01195	6843	8498	5572	5264	121 42 31.7
8 20	1.00019	0.11886	1.00084	6844	8499	5563	5254	122 57 30.8
8 25	0.95710	0.13000	0.98973	6846	8501	5553	5244	124 12 30.0
8 30	0.91402	0.14114	0.97862	6848	8503	5543	5234	125 27 29.2
8 35	0.87093	0.15228	0.96751	6849	8504	5534	5224	126 42 28.3
8 40	0.82785	0.16342	0.95639	6851	8505	5524	5215	127 57 27.5
8 45	—0.78476	+0.17457	—0.94527	6853	8507	5514	5205	129 12 26.7

ANNULAR ECLIPSE

OF

JAN. 10, 1861.



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	-9.57	-9.56	
8 50	-0.74167	+0.18572	-0.93415	6854	8508	5505	5195	130° 27' 25.8
8 55	0.69859	0.19687	0.92303	6856	8510	5495	5185	131 42 25.0
9 0	0.65550	0.20802	0.91190	6858	8512	5485	5175	132 57 24.2
9 5	0.61241	0.21917	0.90077	6859	8513	5476	5166	134 12 23.3
9 10	0.56933	0.23033	0.88964	6860	8515	5467	5156	135 27 22.5
9 15	0.52625	0.24149	0.87851	6862	8517	5457	5146	136 42 21.7
9 20	0.48316	0.25265	0.86738	6863	8518	5448	5136	137 57 20.8
9 25	0.44008	0.26381	0.85624	6865	8520	5438	5126	139 12 20.0
9 30	0.39700	0.27497	0.84510	6867	8522	5428	5116	140 27 19.2
9 35	0.35391	0.28613	0.83396	6868	8523	5419	5106	141 42 18.3
9 40	0.31083	0.29730	0.82281	6870	8524	5409	5096	142 57 17.5
9 45	0.26775	0.30847	0.81166	6872	8526	5399	5086	144 12 16.7
9 50	0.22467	0.31964	0.80051	6873	8527	5390	5076	145 27 15.8
9 55	0.18159	0.33081	0.78936	6875	8529	5380	5066	146 42 14.9
10 0	0.13851	0.34199	0.77821	6877	8531	5370	5056	147 57 14.1
10 5	0.09543	0.35317	0.76706	6878	8532	5361	5047	149 12 13.2
10 10	0.05235	0.36435	0.75590	6879	8534	5351	5037	150 27 12.4
10 15	-0.00928	0.37553	0.74474	6881	8536	5341	5027	151 42 11.6
10 20	+0.03380	0.38671	0.73358	6882	8537	5332	5017	152 57 10.7
10 25	0.07688	0.39789	0.72241	6884	8539	5322	5007	154 12 9.9
10 30	0.11995	0.40908	0.71124	6886	8541	5312	4997	155 27 9.1
10 35	0.16303	0.42027	0.70007	6887	8542	5303	4987	156 42 8.2
10 40	0.20610	0.43146	0.68890	6889	8543	5293	4977	157 57 7.4
10 45	0.24917	0.44265	0.67772	6891	8545	5283	4967	159 12 6.6
10 50	0.29224	0.45385	0.66655	6892	8546	5274	4957	160 27 5.7
10 55	0.33531	0.46505	0.65537	6894	8548	5264	4947	161 42 4.8
11 0	0.37837	0.47625	0.64419	6896	8550	5254	4937	162 57 4.0
11 5	0.42144	0.48745	0.63301	6897	8551	5245	4927	164 12 3.1
11 10	0.46451	0.49865	0.62183	6898	8552	5235	4917	165 27 2.3
11 15	0.50757	0.50986	0.61064	6900	8554	5225	4908	166 42 1.5
11 20	0.55064	0.52106	0.59945	6901	8555	5216	4898	167 57 0.6
11 25	0.59370	0.53227	0.58826	6903	8557	5206	4888	169 11 59.8
11 30	0.63676	0.54348	0.57706	6905	8559	5196	4878	170 26 59.0
11 35	0.67982	0.55469	0.56586	6906	8560	5187	4868	171 41 58.1
11 40	0.72288	0.56590	0.55466	6908	8561	5177	4858	172 56 57.3
11 45	0.76594	0.57712	0.54346	6910	8563	5167	4848	174 11 56.5
11 50	0.80900	0.58834	0.53226	6911	8564	5158	4838	175 26 55.6
11 55	0.85206	0.59956	0.52106	6913	8566	5148	4828	176 41 54.8
12 0	0.89511	0.61078	0.50985	6915	8568	5138	4818	177 56 54.0
12 5	0.93817	0.62200	0.49864	6916	8569	5129	4808	179 11 53.1
12 10	0.98122	0.63322	0.48743	6918	8571	5119	4798	180 26 52.3
12 15	1.02427	0.64445	0.47622	6920	8573	5109	4789	181 41 51.5
12 20	1.06732	0.65568	0.46500	6921	8574	5100	4779	182 56 50.6
12 25	1.11037	0.66691	0.45378	6923	8576	5090	4769	184 11 49.8
12 30	1.15342	0.67814	0.44256	6925	8578	5080	4759	185 26 49.0
12 35	1.19647	0.68937	0.43134	6926	8579	5071	4749	186 41 48.1
12 40	1.23951	0.70060	0.42012	6928	8580	5061	4739	187 56 47.3
12 45	1.28255	0.71184	0.40889	6930	8582	5051	4729	189 11 46.5
12 50	1.32559	0.72308	0.39766	6931	8583	5042	4719	190 26 45.6
12 55	1.36863	0.73432	0.38643	6933	8585	5032	4709	191 41 44.8
13 0	1.41167	0.74556	0.37520	6935	8587	5022	4699	192 56 44.0
13 5	1.45471	0.75680	0.36397	6936	8588	5013	4689	194 11 43.1
13 10	1.49775	0.76804	0.35273	6938	8589	5003	4679	195 26 42.3
13 15	1.54078	0.77929	0.34149	6940	8591	4993	4669	196 41 41.5
13 20	+1.58381	+0.79054	-0.33025	6941	8593	4983	4659	197 56 40.6

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
^h ^m			^h ^m		
8 25	-0.41593	-0.44380	10 25	-0.14804	-0.17648
8 30	0.40479	0.43269	10 30	0.13686	0.16531
8 35	0.39365	0.42158	10 35	0.12567	0.15414
8 40	0.38251	0.41046	10 40	0.11448	0.14297
8 45	0.37136	0.39934	10 45	0.10329	0.13179
8 50	0.36021	0.38822	10 50	0.09209	0.12061
8 55	0.34906	0.37710	10 55	0.08089	0.10943
9 0	0.33791	0.36597	11 0	0.06969	0.09825
9 5	0.32676	0.35484	11 5	0.05849	0.08707
9 10	0.31560	0.34371	11 10	0.04729	0.07589
9 15	0.30444	0.33258	11 15	0.03609	0.06470
9 20	0.29328	0.32145	11 20	0.02489	0.05351
9 25	0.28212	0.31031	11 25	0.01368	0.04232
9 30	0.27096	0.29917	11 30	-0.00247	0.03112
9 35	0.25980	0.28803	11 35	+0.00874	0.01992
9 40	0.24863	0.27688	11 40	0.01995	-0.00872
9 45	0.23746	0.26573	11 45	0.03117	+0.00248
9 50	0.22629	0.25458	11 50	0.04239	0.01368
9 55	0.21512	0.24343	11 55	0.05361	0.02488
10 0	0.20394	0.23228	12 0	0.06483	0.03609
10 5	0.19276	0.22113	12 5	0.07605	0.04730
10 10	0.18158	0.20997	12 10	0.08727	0.05851
10 15	0.17040	0.19881	12 15	0.09850	0.06972
10 20	-0.15922	-0.18765	12 20	+0.10973	+0.08094

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically increasing log E and decreasing log F by 0.000004, and by numerically decreasing log G and increasing log H by 0.000025.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
^h ^m						
7 30	+8617.7	+2223.2	+2217.2	+143.63	+37.05	+36.95
7 45	8617.7	2224.4	2218.6	143.63	37.07	36.98
8 0	8617.6	2225.6	2220.0	143.63	37.09	37.00
8 15	8617.6	2226.8	2221.4	143.63	37.11	37.02
8 30	8617.5	2228.0	2222.7	143.63	37.13	37.04
8 45	8617.3	2229.2	2224.1	143.62	37.15	37.07
9 0	8617.0	2230.5	2225.4	143.62	37.17	37.09
9 15	8616.8	2231.7	2226.8	143.61	37.19	37.11
9 30	8616.5	2232.8	2228.2	143.61	37.21	37.14
9 45	8616.2	2234.0	2229.6	143.60	37.23	37.16
10 0	8615.8	2235.2	2231.0	143.60	37.25	37.18
10 15	8615.3	2236.4	2232.4	143.59	37.27	37.21
10 30	8614.7	2237.7	2233.7	143.58	37.29	37.23
10 45	8614.1	2238.9	2235.0	143.57	37.31	37.25
11 0	8613.5	2240.0	2236.3	143.56	37.33	37.27
11 15	8612.9	2241.1	2237.7	143.55	37.35	37.29
11 30	8612.3	2242.2	2239.0	143.54	37.37	37.32
11 45	+8611.7	+2243.2	+2240.3	+143.53	+37.39	+37.34

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.						
Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C.
^h ^m 12 0	+8611.0	+2244.2	+2241.6	+143.52	+37.40	+37.36
12 15	8610.2	2245.2	2242.9	143.50	37.42	37.38
12 30	8609.3	2246.2	2244.2	143.49	37.43	37.40
12 45	8608.4	2247.2	2245.5	143.47	37.45	37.42
13 0	8607.5	2248.3	2246.7	143.46	37.47	37.44
13 15	+8606.6	+2249.4	+2248.0	+143.44	+37.49	+37.47

II. An Annular Eclipse of the Sun, July 7, 1861, invisible at Washington, with the following elements :—

Washington Mean Time of δ in Right Ascension, July 7 ^d 9 ^h 7 ^m 19.9 ^s.

Sun's and Moon's R.A.	^h ^m ^s 7 8 44.18	Hourly Motions	^s 10.25 and 138.27
Sun's Declination	+22° 31' 1.8"	Hourly Motion	— 0' 16.8"
Moon's Declination	+22 18 6.1	"	— 6 48.9
Sun's Equa. Hor. Par.	8.4	True Semidiameter	15 44.0
Moon's Equa. Hor. Par.	56 43.8	"	15 26.8

From these elements may be deduced the following results :—

Eclipse begins on the Earth, July 7^d 6^h 9^m.9, Washington mean time, in longitude 182° 53'.9 West from Washington, and in latitude 3° 49'.8 North.

Central Eclipse begins 7^h 12^m.7, in longitude 196° 49'.2 West from Washington, and in latitude 0° 27'.1 South.

Central Eclipse at noon, 9^h 7^m.3, in longitude 135° 40'.3 West from Washington, and in latitude 9° 22'.3 North.

Central Eclipse ends 10^h 50^m.9, in longitude 81° 50'.8, West from Washington, and in latitude 23° 26'.5 South.

Eclipse ends on the Earth 11^h 53^m.6, in longitude 95° 29'.1 West from Washington, and in latitude 19° 16'.0 South.

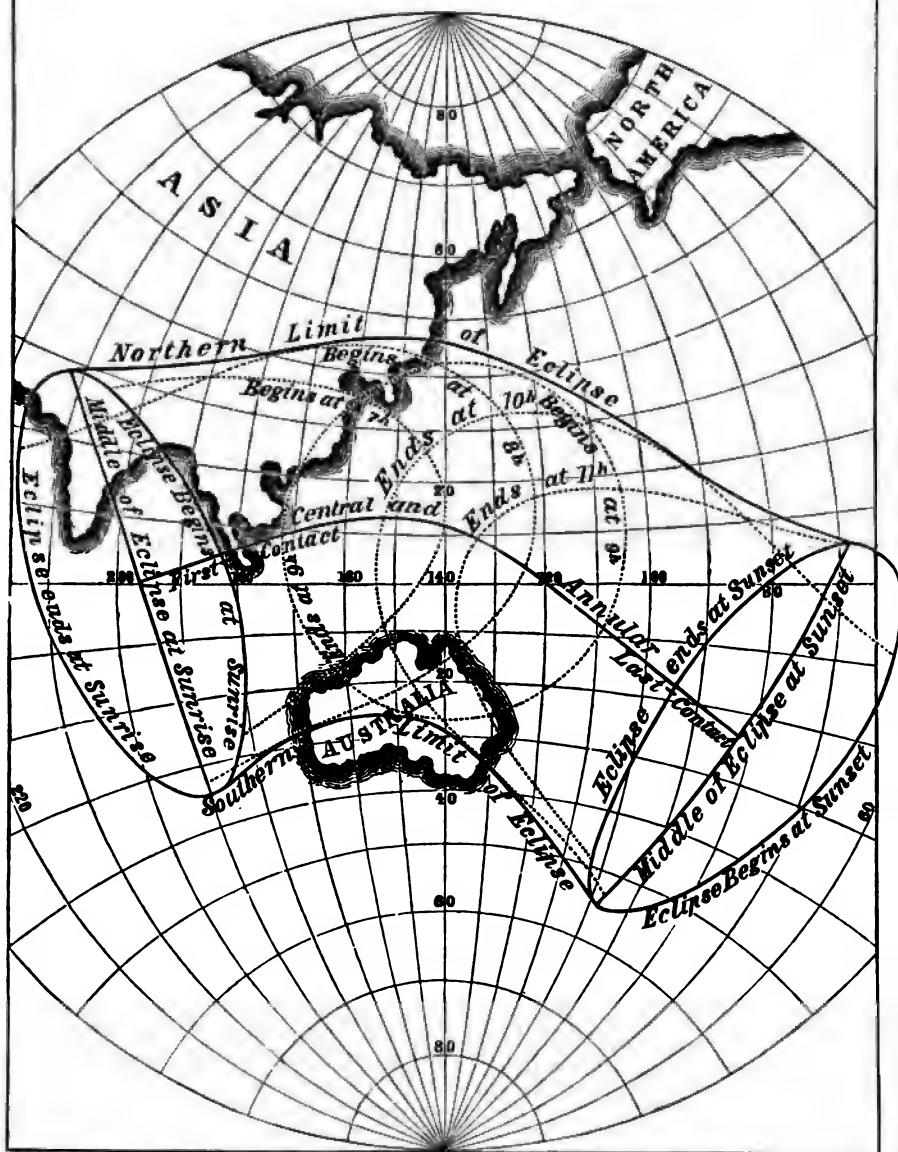
DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
^h ^m 6 5	-1.59004	+0.67208	-0.43041	9.96	9.96	+9.57	+9.58	90° 5' 20.3"
6 10	1.54644	0.66253	0.43995	6346	4688	8565	8196	91 20 20.2
6 15	1.50285	0.65298	0.44949	6348	4691	8552	8183	92 35 20.1
6 20	1.45925	0.64343	0.45903	6349	4692	8545	8177	93 50 20.0
6 25	1.41565	0.63388	0.46857	6350	4693	8538	8170	95 5 19.9
6 30	1.37205	0.62432	0.47811	6351	4694	8531	8163	96 20 19.8
6 35	1.32845	0.61476	0.48765	6353	4695	8525	8157	97 35 19.7
6 40	1.28485	0.60520	0.49720	6354	4696	8518	8150	98 50 19.6
6 45	1.24125	0.59564	0.50675	6355	4698	8511	8143	100 5 19.5
6 50	1.19765	0.58608	0.51630	6356	4699	8505	8137	101 20 19.3
6 55	1.15405	0.57651	0.52586	6357	4700	8498	8130	102 35 19.2
7 0	1.11045	0.56694	0.53542	6358	4701	8491	8123	103 50 19.1
7 5	1.06685	0.55737	0.54498	6359	4702	8484	8117	105 5 19.0
7 10	1.02325	0.54780	0.55454	6360	4703	8477	8111	106 20 18.9
7 15	0.97964	0.53822	0.56410	6361	4704	8470	8104	107 35 18.8
7 20	0.93604	0.52864	0.57366	6362	4706	8463	8098	108 50 18.7
7 25	-0.89244	+0.51906	-0.58323	6364	4707	8456	8091	110 5 18.6

ANNULAR ECLIPSE

OF

JULY 7, 1861.



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.								
Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	+9.57	+9.58	
7 30	-0.84883	+0.50948	-0.59280	6365	4708	8450	8084	111° 20' 18.5
7 35	0.80523	0.49990	0.60237	6366	4709	8443	8078	112 35 18.4
7 40	0.76163	0.49031	0.61194	6367	4710	8436	8071	113 50 18.3
7 45	0.71802	0.48072	0.62152	6368	4711	8429	8064	115 5 18.2
7 50	0.67442	0.47113	0.63109	6370	4713	8423	8058	116 20 18.1
7 55	0.63081	0.46154	0.64067	6371	4714	8416	8051	117 35 18.0
8 0	0.58720	0.45195	0.65025	6372	4715	8409	8044	118 50 17.9
8 5	0.54360	0.44236	0.65983	6373	4716	8402	8038	120 5 17.8
8 10	0.50000	0.43276	0.66941	6374	4717	8395	8032	121 20 17.7
8 15	0.45639	0.42316	0.67900	6375	4718	8388	8025	122 35 17.6
8 20	0.41279	0.41356	0.68859	6376	4720	8382	8019	123 50 17.5
8 25	0.36918	0.40395	0.69818	6377	4721	8375	8012	125 5 17.4
8 30	0.32557	0.39434	0.70777	6379	4722	8368	8006	126 20 17.3
8 35	0.28197	0.38473	0.71736	6380	4723	8361	7999	127 35 17.2
8 40	0.23837	0.37512	0.72695	6381	4724	8355	7992	128 50 17.1
8 45	0.19476	0.36550	0.73655	6382	4725	8348	7986	130 5 17.0
8 50	0.15116	0.35589	0.74615	6383	4727	8341	7979	131 20 16.9
8 55	0.10755	0.34627	0.75575	6384	4728	8334	7972	132 35 16.8
9 0	0.06394	0.33665	0.76535	6385	4729	8328	7965	133 50 16.8
9 5	-0.02034	0.32708	0.77495	6386	4730	8321	7959	135 5 16.7
9 10	+0.02326	0.31741	0.78455	6387	4731	8314	7952	136 20 16.6
9 15	0.06687	0.30778	0.79416	6388	4732	8307	7945	137 35 16.5
9 20	0.11047	0.29815	0.80377	6389	4734	8301	7939	138 50 16.4
9 25	0.15407	0.28852	0.81338	6391	4735	8294	7932	140 5 16.3
9 30	0.19768	0.27889	0.82299	6392	4736	8287	7925	141 20 16.2
9 35	0.24128	0.26926	0.83260	6393	4737	8280	7919	142 35 16.1
9 40	0.28488	0.25962	0.84221	6394	4738	8273	7912	143 50 16.0
9 45	0.32849	0.24998	0.85183	6396	4739	8266	7905	145 5 15.9
9 50	0.37209	0.24034	0.86145	6397	4741	8260	7899	146 20 15.8
9 55	0.41569	0.23070	0.87107	6398	4742	8253	7892	147 35 15.7
10 0	0.45930	0.22105	0.88069	6399	4743	8246	7885	148 50 15.6
10 5	0.50290	0.21140	0.89031	6400	4744	8239	7879	150 5 15.5
10 10	0.54650	0.20175	0.89993	6401	4745	8232	7872	151 20 15.4
10 15	0.59010	0.19210	0.90956	6402	4746	8225	7865	152 35 15.3
10 20	0.63370	0.18245	0.91919	6404	4748	8219	7859	153 50 15.2
10 25	0.67730	0.17280	0.92882	6405	4749	8212	7852	155 5 15.1
10 30	0.72090	0.16314	0.93845	6406	4750	8205	7845	156 20 15.0
10 35	0.76450	0.15348	0.94808	6407	4751	8198	7839	157 35 14.9
10 40	0.80810	0.14382	0.95771	6409	4752	8191	7832	158 50 14.8
10 45	0.85169	0.13416	0.96735	6410	4753	8184	7825	160 5 14.7
10 50	0.89529	0.12450	0.97699	6411	4755	8178	7819	161 20 14.6
10 55	0.93889	0.11484	0.98663	6412	4756	8171	7812	162 35 14.5
11 0	0.98248	0.10517	0.99627	6413	4757	8164	7805	163 50 14.4
11 5	1.02608	0.09550	1.00591	6414	4758	8157	7799	165 5 14.3
11 10	1.06967	0.08583	1.01555	6415	4759	8150	7792	166 20 14.2
11 15	1.11326	0.07616	1.02520	6416	4760	8143	7785	167 35 14.1
11 20	1.15685	0.06649	1.03485	6417	4762	8137	7779	168 50 14.0
11 25	1.20044	0.05681	1.04450	6418	4763	8130	7772	170 5 13.9
11 30	1.24403	0.04713	1.05415	6420	4764	8123	7765	171 20 13.8
11 35	1.28762	0.03745	1.06380	6421	4765	8116	7759	172 35 13.7
11 40	1.33121	0.02777	1.07345	6422	4766	8109	7752	173 50 13.6
11 45	1.37479	0.01808	1.08311	6423	4767	8102	7745	175 5 13.5
11 50	1.41838	+0.00840	1.09276	6424	4769	8096	7739	176 20 13.5
11 55	1.46197	-0.00129	1.10242	6425	4770	8089	7732	177 35 13.4
12 0	+1.50555	-0.01098	-1.11208	6426	4771	8082	7725	178 50 13.3

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
h m			h m		
7 10	+0.00191	-0.00865	9 5	-0.21886	-0.22906
7 15	-0.00767	0.01821	9 10	0.22848	0.23866
7 20	0.01725	0.02777	9 15	0.23811	0.24827
7 25	0.02683	0.03734	9 20	0.24774	0.25788
7 30	0.03641	0.04691	9 25	0.25737	0.26749
7 35	0.04599	0.05648	9 30	0.26700	0.27710
7 40	0.05558	0.06605	9 35	0.27663	0.28671
7 45	0.06517	0.07563	9 40	0.28627	0.29632
7 50	0.07476	0.08520	9 45	0.29591	0.30594
7 55	0.08435	0.09478	9 50	0.30555	0.31556
8 0	0.09394	0.10436	9 55	0.31519	0.32518
8 5	0.10353	0.11394	10 0	0.32484	0.33480
8 10	0.11313	0.12352	10 5	0.33449	0.34442
8 15	0.12273	0.13311	10 10	0.34414	0.35404
8 20	0.13233	0.14270	10 15	0.35379	0.36367
8 25	0.14194	0.15229	10 20	0.36344	0.37330
8 30	0.15155	0.16188	10 25	0.37309	0.38293
8 35	0.16116	0.17147	10 30	0.38275	0.39256
8 40	0.17077	0.18106	10 35	0.39241	0.40219
8 45	0.18039	0.19066	10 40	0.40207	0.41182
8 50	0.19000	0.20026	10 45	0.41173	0.42146
8 55	0.19962	0.20986	10 50	0.42139	0.43110
9 0	-0.20924	-0.21946	10 55	-0.43105	-0.44074

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically decreasing log E and increasing log F by 0.000004, and by numerically increasing log G and decreasing log H by 0.000024.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
h m						
6 0	+8719.0	-1908.7	-1906.3	+145.32	-31.81	-31.77
6 15	8719.4	1910.0	1907.7	145.32	31.83	31.79
6 30	8719.7	1911.3	1909.0	145.33	31.85	31.82
6 45	8720.0	1912.6	1910.3	145.33	31.88	31.84
7 0	8720.3	1913.9	1911.5	145.34	31.90	31.86
7 15	8720.6	1915.2	1912.7	145.34	31.92	31.88
7 30	8720.8	1916.5	1913.8	145.35	31.94	31.90
7 45	8720.9	1917.8	1915.0	145.35	31.96	31.92
8 0	8721.0	1919.1	1916.1	145.35	31.98	31.93
8 15	8721.0	1920.4	1917.2	145.35	32.01	31.95
8 30	8721.0	1921.7	1918.3	145.35	32.03	31.97
8 45	8721.0	1923.0	1919.3	145.35	32.05	31.99
9 0	8720.9	1924.2	1920.3	145.35	32.07	32.00
9 15	8720.8	1925.5	1921.3	145.35	32.09	32.02
9 30	8720.7	1926.7	1922.3	145.34	32.11	32.04
9 45	8720.5	1927.9	1923.3	145.34	32.13	32.05
10 0	8720.3	1929.1	1924.3	145.34	32.15	32.07
10 15	8720.0	1930.2	1925.3	145.33	32.17	32.09
10 30	8719.7	1931.3	1926.3	145.33	32.19	32.10
10 45	8719.3	1932.4	1927.3	145.32	32.21	32.12
11 0	+8718.8	-1933.5	-1928.3	+145.31	-32.22	-32.14

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
^h ^m 11 15	+8718.3	—1934.7	—1929.3	+145.30	—32.24	—32.15
11 30	8717.8	1935.8	1930.2	145.30	32.26	32.17
11 45	8717.3	1937.0	1931.2	145.29	32.28	32.19
12 0	+8716.8	—1938.1	—1932.1	+145.28	—32.30	—32.20

III. A Partial Eclipse of the Moon, December 16, 1861, visible at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, December 16 ^d ^h ^m ^s 15 3 26.1.

Sun's Right Ascension	^h ^m ^s 17 40 8.73	Hourly Motion	^s 11.08
Moon's Right Ascension	5 40 8.73	" "	133.45
Sun's Declination	—23° 22' 43.5	Hourly Motion	— 0' 5.2
Moon's Declination	+24 11 27.6	" "	— 1 43.5
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 17.9
Moon's Equa. Hor. Par.	54 44.7	" "	14 54.3

From these elements may be deduced the following results:—

Moon enters Penumbra, December	^d ^h ^m 16 12 37.6	Washington mean time.	
Moon enters Shadow	16 14 19.1	" "	
Greatest Eclipse	16 15 10.2	" "	
Moon leaves Shadow	16 16 1.3	" "	
Moon leaves Penumbra	16 17 42.6	" "	

First contact of Shadow with Moon's limb 158° from north point towards the East, when the Moon is vertical in longitude 35° 51' West from Washington, and in latitude 24° 21' North.

Last contact of Shadow with Moon's limb 150° from north point towards the West, when the Moon is vertical in longitude 60° 31' West from Washington, and in latitude 24° 18' North.

Magnitude of Eclipse = 0.185 (Moon's diameter = 1.)

IV. A Total Eclipse of the Sun, December 30, 1861, visible as a partial one at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, December 30 ^d ^h ^m ^s 20 50 32.8.

Sun's and Moon's R.A.	^h ^m ^s 18 43 19.89	Hourly Motions	^s 11.05 and 155.71
Sun's Declination	—23° 4' 59.9	Hourly Motion	+ 0' 11.5
Moon's Declination	—22 33 31.1	" "	+ 6 3.0
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 16.1
Moon's Equa. Hor. Par.	59 56.3	" "	16 19.2

From these elements may be deduced the following results:—

Eclipse begins on the Earth, December 30^d 18^h 7^m.0, Washington mean time, in longitude 357° 4'.6 West from Washington, and in latitude 8° 58'.0 North.

Central Eclipse begins 19^h 10^m.5, in longitude 8° 5'.0 West from Washington, and in latitude 19° 39'.2 North.

Central Eclipse at noon, 20^h 50^m.5, in longitude 311° 46'.9 West from Washington, and in latitude 8° 44'.7 North.

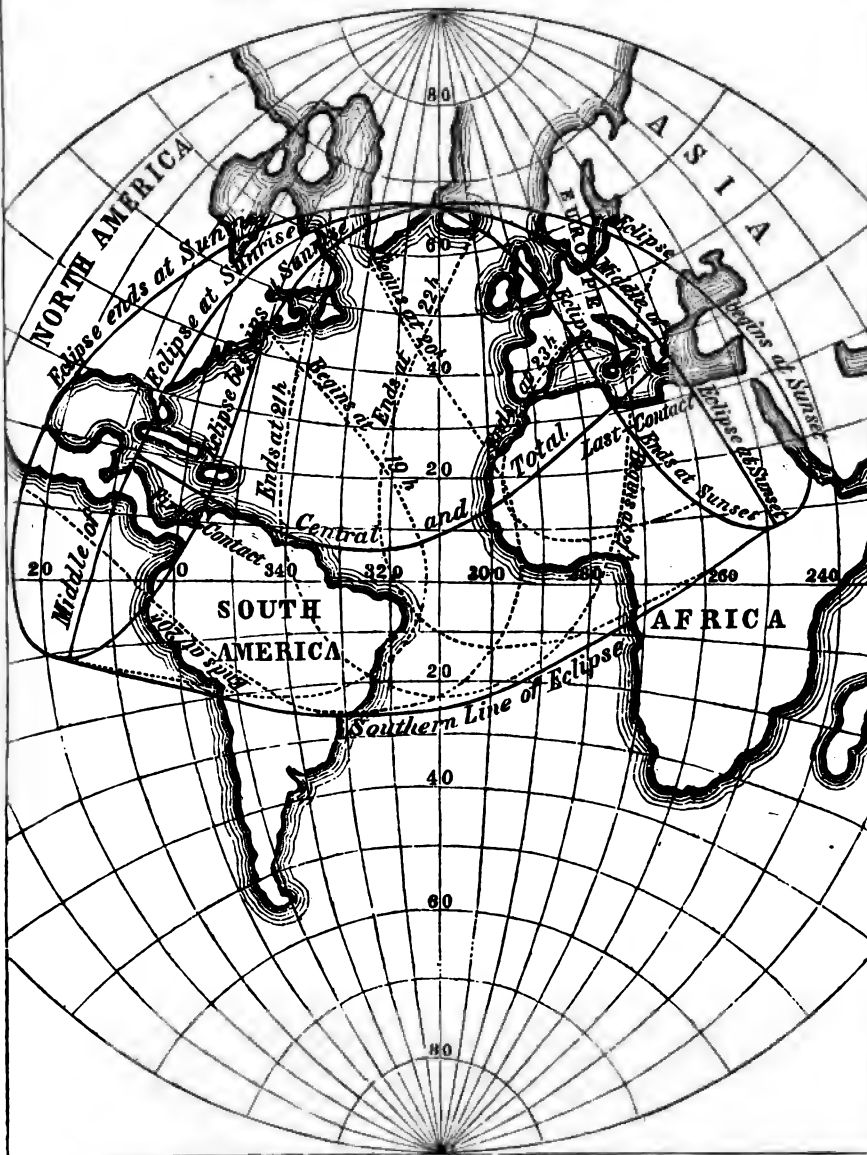
Central Eclipse ends 22^h 11^m.2, in longitude 260° 55'.2, West from Washington, and in latitude 37° 32'.3 North.

Eclipse ends on the Earth 23^h 14^m.8, in longitude 270° 24'.0 West from Washington, and in latitude 27° 12'.0 North.

TOTAL ECLIPSE

OF

DEC. 30, 1861



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	-9.59	-9.58	
18 0	-1.58790	+0.79326	-0.29604	2845	4606	8350	8662	269° 9' 16.0
18 5	1.54134	0.80139	0.28794	2846	4607	8346	8658	270 24 15.0
18 10	1.49479	0.80952	0.27984	2847	4608	8342	8653	271 39 13.9
18 15	1.44824	0.81765	0.27173	2847	4608	8337	8649	272 54 12.8
18 20	1.40168	0.82578	0.26362	2848	4609	8333	8645	274 9 11.8
18 25	1.35513	0.83391	0.25551	2849	4610	8329	8640	275 24 10.7
18 30	1.30858	0.84205	0.24740	2850	4611	8325	8636	276 39 9.7
18 35	1.26202	0.85019	0.23929	2850	4612	8320	8632	277 54 8.6
18 40	1.21547	0.85833	0.23117	2851	4612	8316	8627	279 9 7.6
18 45	1.16892	0.86647	0.22305	2852	4613	8312	8623	280 24 6.5
18 50	1.12236	0.87461	0.21493	2853	4614	8308	8619	281 39 5.5
18 55	1.07581	0.88276	0.20681	2854	4615	8303	8614	282 54 4.4
19 0	1.02926	0.89091	0.19869	2854	4615	8299	8610	284 9 3.3
19 5	0.98270	0.89906	0.19057	2855	4616	8295	8605	285 24 2.3
19 10	0.93614	0.90721	0.18244	2856	4617	8290	8601	286 39 1.2
19 15	0.88959	0.91537	0.17431	2857	4618	8286	8597	287 54 0.2
19 20	0.84303	0.92352	0.16618	2858	4619	8282	8592	289 8 59.1
19 25	0.79648	0.93168	0.15804	2858	4619	8278	8588	290 23 58.1
19 30	0.74993	0.93984	0.14990	2859	4620	8273	8583	291 38 57.0
19 35	0.70337	0.94800	0.14176	2860	4621	8269	8579	292 53 56.0
19 40	0.65681	0.95616	0.13362	2861	4622	8265	8575	294 8 54.9
19 45	0.61026	0.96433	0.12547	2862	4622	8261	8570	295 23 53.8
19 50	0.56370	0.97249	0.11732	2862	4623	8256	8566	296 38 52.8
19 55	0.51715	0.98066	0.10917	2863	4624	8252	8561	297 53 51.7
20 0	0.47060	0.98883	0.10102	2864	4625	8248	8557	299 8 50.7
20 5	0.42404	0.99700	0.09287	2865	4626	8243	8553	300 23 49.6
20 10	0.37749	1.00517	0.08471	2866	4626	8239	8548	301 38 48.5
20 15	0.33094	1.01335	0.07655	2866	4627	8235	8544	302 53 47.5
20 20	0.28438	1.02153	0.06839	2867	4628	8230	8539	304 8 46.4
20 25	0.23783	1.02971	0.06023	2868	4629	8226	8535	305 23 45.4
20 30	0.19128	1.03789	0.05207	2869	4630	8222	8531	306 38 44.3
20 35	0.14473	1.04607	0.04391	2870	4630	8218	8526	307 53 43.3
20 40	0.09818	1.05425	0.03574	2871	4631	8213	8522	309 8 42.2
20 45	0.05163	1.06244	0.02757	2871	4632	8209	8517	310 23 41.2
20 50	-0.00508	1.07063	0.01940	2872	4633	8205	8513	311 38 40.1
20 55	+0.04147	1.07882	0.01122	2873	4633	8200	8508	312 53 39.0
21 0	0.08801	1.08701	-0.00304	2874	4634	8196	8504	314 8 38.0
21 5	0.13456	1.09520	+0.00514	2874	4635	8192	8500	315 23 36.9
21 10	0.18111	1.10340	0.01332	2875	4636	8188	8495	316 38 35.9
21 15	0.22765	1.11160	0.02151	2876	4637	8183	8491	317 53 34.8
21 20	0.27420	1.11980	0.02969	2877	4637	8179	8486	319 8 33.8
21 25	0.32074	1.12800	0.03788	2878	4638	8174	8482	320 23 32.7
21 30	0.36728	1.13620	0.04607	2879	4639	8170	8478	321 38 31.6
21 35	0.41383	1.14440	0.05426	2879	4640	8166	8473	322 53 30.6
21 40	0.46037	1.15261	0.06245	2880	4640	8161	8469	324 8 29.5
21 45	0.50691	1.16082	0.07065	2881	4641	8157	8464	325 23 28.5
21 50	0.55345	1.16903	0.07885	2882	4642	8153	8460	326 38 27.4
21 55	0.59999	1.17724	0.08705	2883	4643	8148	8455	327 53 26.4
22 0	0.64653	1.18545	0.09525	2883	4644	8144	8451	329 8 25.3
22 5	0.69307	1.19366	0.10345	2884	4645	8140	8446	330 23 24.2
22 10	0.73961	1.20188	0.11166	2885	4645	8135	8442	331 38 23.2
22 15	0.78614	1.21010	0.11987	2886	4646	8131	8437	332 53 22.1
22 20	0.83268	1.21832	0.12808	2887	4647	8127	8433	334 8 21.1
22 25	0.87921	1.22654	0.13629	2887	4648	8122	8429	335 23 20.0
22 30	+0.92574	+1.23476	0.14450	2888	4648	8118	8424	336 38 19.0

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
				9.96	9.96	-9.59	-9.58	
h m 22 35	+0.97227	+1.24298	+0.15271	2889	4649	8114	8420	337° 53' 17.9
22 40	1.01880	1.25121	0.16093	2890	4650	8110	8415	339 8 16.8
22 45	1.06532	1.25944	0.16915	2891	4651	8105	8411	340 23 15.8
22 50	1.11185	1.26767	0.17737	2892	4652	8101	8406	341 38 14.7
22 55	1.15837	1.27590	0.18560	2892	4652	8096	8402	342 53 13.7
23 0	1.20489	1.28413	0.19383	2893	4653	8092	8397	344 8 12.6
23 5	1.25141	1.29236	0.20206	2894	4654	8088	8393	345 23 11.6
23 10	1.29793	1.30060	0.21029	2895	4655	8083	8388	346 38 10.5
23 15	1.34445	1.30884	0.21852	2896	4655	8079	8384	347 53 9.4
23 20	+1.39097	+1.31708	+0.22675	2896	4656	8075	8379	349 8 8.4

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
h m 19 5	+0.35320	+0.35529	h m 20 40	+0.50839	+0.51012
19 10	0.36135	0.36342	20 45	0.51658	0.51829
19 15	0.36951	0.37155	20 50	0.52477	0.52646
19 20	0.37766	0.37968	20 55	0.53296	0.53464
19 25	0.38582	0.38782	21 0	0.54115	0.54282
19 30	0.39398	0.39596	21 5	0.54934	0.55100
19 35	0.40214	0.40410	21 10	0.55754	0.55918
19 40	0.41030	0.41224	21 15	0.56574	0.56737
19 45	0.41847	0.42039	21 20	0.57394	0.57555
19 50	0.42663	0.42854	21 25	0.58214	0.58374
19 55	0.43480	0.43669	21 30	0.59034	0.59193
20 0	0.44297	0.44484	21 35	0.59854	0.60012
20 5	0.45114	0.45299	21 40	0.60675	0.60831
20 10	0.45931	0.46115	21 45	0.61496	0.61651
20 15	0.46749	0.46931	21 50	0.62317	0.62471
20 20	0.47567	0.47747	21 55	0.63138	0.63291
20 25	0.48385	0.48563	22 0	0.63959	0.64111
20 30	0.49203	0.49379	22 5	0.64780	0.64931
20 35	0.50021	0.50195	22 10	0.65602	0.65752
20 40	+0.50839	+0.51012	22 15	+0.66424	+0.66573

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically increasing log E and decreasing log F by 0.000004, and by numerically decreasing log G and increasing log H by 0.000024.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A.	B.	C.
h m 18 0	+9310.5	+1625.2	+1620.2	+155.18	+27.09	+27.00
18 15	9310.6	1626.4	1621.3	155.18	27.11	27.02
18 30	9310.7	1627.5	1622.5	155.18	27.13	27.04
18 45	9310.8	1628.7	1623.7	155.18	27.15	27.06
19 0	9310.9	1629.8	1625.0	155.18	27.16	27.08
19 15	9311.0	1630.9	1626.3	155.18	27.18	27.10
19 30	9311.0	1632.0	1627.6	155.18	27.20	27.13
19 45	+9310.9	+1633.1	+1628.9	+155.18	+27.22	+27.15

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C.
^h ^m 20 0	+9310.8	+1634.2	+1630.3	+155.18	+27.24	+27.17
20 15	9310.5	1635.3	1631.6	155.17	27.25	27.19
20 30	9310.2	1636.3	1633.0	155.17	27.27	27.22
20 45	9309.8	1637.4	1634.3	155.16	27.29	27.24
21 0	9309.4	1638.5	1635.7	155.16	27.31	27.26
21 15	9309.0	1639.6	1637.0	155.15	27.33	27.28
21 30	9308.6	1640.7	1638.2	155.14	27.35	27.30
21 45	9308.1	1641.7	1639.4	155.14	27.36	27.32
22 0	9307.6	1642.7	1640.6	155.13	27.38	27.34
22 15	9306.9	1643.7	1641.8	155.12	27.39	27.36
22 30	9306.0	1644.7	1643.0	155.10	27.41	27.38
22 45	9305.2	1645.7	1644.2	155.09	27.43	27.40
23 0	9304.3	1646.7	1645.4	155.07	27.45	27.42
23 15	9303.5	1647.7	1646.6	155.06	27.46	27.44
23 30	+9302.6	+1648.8	+1647.8	+155.04	+27.48	+27.46

A Transit of Mercury, November 11, 1861, invisible at Washington, with the following elements:—

Washington mean time of ϕ in Right Ascension, November 11^d 14^h 59^m 43.6^s.

Sun's and Mercury's R.A. 15^h 10^m 4.57^s Hourly Motions +10.18 and -12.60

Sun's Declination -17° 44' 44.6" Hourly Motion - 0' 40.6"

Mercury's Declination -17° 32' 45.1" " " + 1' 43.8"

Sun's Equa. Hor. Par. 8.67 True Semidiameter 16 10.3

Mercury's Equa. Hor. Par. 12.68 " " 4.94

From these elements may be deduced the following results, with reference to the centre of the Earth:—

Ingress,	November 11 ^d 12 ^h 9 ^m 25 ^s
Middle of Transit,	11 14 10 38
Egress,	11 16 11 53
Least distance of centres,	10' 57.8"

First contact of Mercury with Sun's limb 72° from north point towards the East, when the Sun is vertical in longitude 186° 4'.1 West from Washington, and in latitude 17° 49'.5 South.

Last contact of Mercury with Sun's limb 24° from north point towards the West, when the Sun is vertical in longitude 246° 40'.8, and in latitude 17° 52'.2 South.

The Washington mean time of Ingress and Egress for any place on the surface of the Earth may be computed from the following formulæ, in which R is the radius of the place, θ its geocentric North latitude, and λ its longitude West from Washington:—

Ingress, 12^h 9^m 25.5^s - 16.64 $R \sin \theta$ + 52.30 $R \cos \theta \cos (\lambda + 78^\circ 24'.0)$.

Egress, 16^h 11^m 53.3^s + 47.86 $R \sin \theta$ + 26.68 $R \cos \theta \cos (\lambda + 57^\circ 40'.8)$.

ELEMENTS FOR FACILITATING THE CALCULATION OF ECLIPSES OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Jan.	1	p ^h Leonis	5	+63 ^o -23	12 5.1	- 4 14 16	+0.3671	0.5378	-2613	+8.0770	0.0000
	1	e Leonis <td>5</td> <th>+88 +36</th> <th>19 53.0</th> <th>+ 3 18 20</th> <th>+1.2880</th> <th>.5374</th> <th>-2612</th> <th>-8.5919</th> <th>9.9997</th>	5	+88 +36	19 53.0	+ 3 18 20	+1.2880	.5374	-2612	-8.5919	9.9997
	4	69 Virginis <td>5½</td> <th>+75 +24</th> <th>1 45.5</th> <th>+ 7 22 56</th> <th>+1.1290</th> <th>.5517</th> <th>-2243</th> <th>-9.4201</th> <th>.9844</th>	5½	+75 +24	1 45.5	+ 7 22 56	+1.1290	.5517	-2243	-9.4201	.9844
	4	89 Virginis <td>3½</td> <th>+73 +35</th> <th>11 35.4</th> <th>- 7 7 50</th> <th>+1.2286</th> <th>.5567</th> <th>-2100</th> <th>-9.4767</th> <th>.9796</th>	3½	+73 +35	11 35.4	- 7 7 50	+1.2286	.5567	-2100	-9.4767	.9796
	6	42 Libræ <td>5½</td> <th>+ 9 -60</th> <th>9 33.5</th> <th>-10 52 0</th> <th>-0.2940</th> <th>.5817</th> <th>-1126</th> <th>-9.5983</th> <th>.9628</th>	5½	+ 9 -60	9 33.5	-10 52 0	-0.2940	.5817	-1126	-9.5983	.9628
	6	b Scorpis <td>5</td> <th>+65 +49</th> <th>13 48.1</th> <th>- 6 47 13</th> <th>+1.2615</th> <th>.5831</th> <th>-1019</th> <th>-9.6312</th> <th>.9661</th>	5	+65 +49	13 48.1	- 6 47 13	+1.2615	.5831	-1019	-9.6312	.9661
	6	A Scorpis <td>5</td> <th>+65 0</th> <th>14 51.8</th> <th>- 5 46 1</th> <th>+0.7285</th> <th>.5837</th> <th>-0991</th> <th>-9.6245</th> <th>.9676</th>	5	+65 0	14 51.8	- 5 46 1	+0.7285	.5837	-0991	-9.6245	.9676
	6	B.A.C. 5314 <td>6</td> <th>+65 +15</th> <th>18 43.8</th> <th>- 2 3 0</th> <th>+0.9471</th> <th>.5849</th> <th>-0888</th> <th>-9.6336</th> <th>.9555</th>	6	+65 +15	18 43.8	- 2 3 0	+0.9471	.5849	-0888	-9.6336	.9555
	6	B.A.C. 5347 <td>5</td> <th>+64 +54</th> <th>20 36.5</th> <th>- 0 14 47</th> <th>+1.2738</th> <th>.5856</th> <th>-0837</th> <th>-9.6411</th> <th>.9538</th>	5	+64 +54	20 36.5	- 0 14 47	+1.2738	.5856	-0837	-9.6411	.9538
	7	σ Scorpis <td>3½</td> <th>+29 -33</th> <th>1 48.4</th> <th>+ 4 44 53</th> <th>+0.1612</th> <th>.5871</th> <th>-0696</th> <th>-9.6301</th> <th>.9564</th>	3½	+29 -33	1 48.4	+ 4 44 53	+0.1612	.5871	-0696	-9.6301	.9564
	7	α Scorpis <td>1½</td> <th>+64 + 8</th> <th>5 1.9</th> <th>+ 7 50 50</th> <th>+0.8406</th> <th>.5876</th> <th>-0610</th> <th>-9.6437</th> <th>.9532</th>	1½	+64 + 8	5 1.9	+ 7 50 50	+0.8406	.5876	-0610	-9.6437	.9532
	7	22 Scorpis <td>5</td> <th>- 8 -79</th> <th>5 22.8</th> <th>+ 8 10 55</th> <th>-0.5337</th> <th>.5876</th> <th>-0594</th> <th>-9.6228</th> <th>.9580</th>	5	- 8 -79	5 22.8	+ 8 10 55	-0.5337	.5876	-0594	-9.6228	.9580
	7	A Ophiuchi <td>5</td> <th>+44 -14</th> <th>23 9.9</th> <th>+ 1 15 50</th> <th>+0.4881</th> <th>.5885</th> <th>-0097</th> <th>-9.6479</th> <th>.9522</th>	5	+44 -14	23 9.9	+ 1 15 50	+0.4881	.5885	-0097	-9.6479	.9522
	8	δ Ophiuchi <td>3½</td> <th>+50 -90</th> <th>1 48.1</th> <th>+ 3 47 52</th> <th>-1.1181</th> <th>.5882</th> <th>-0019</th> <th>-9.6236</th> <th>.9578</th>	3½	+50 -90	1 48.1	+ 3 47 52	-1.1181	.5882	-0019	-9.6236	.9578
	12	λ Capricor. <td>5½</td> <th>+78 + 5</th> <th>23 21.3</th> <th>- 2 45 24</th> <th>+0.8624</th> <th>.5147</th> <th>+2242</th> <th>-9.3181</th> <th>.9904</th>	5½	+78 + 5	23 21.3	- 2 45 24	+0.8624	.5147	+2242	-9.3181	.9904
	13	B.A.C. 7620 <td>6</td> <th>+73 -12</th> <th>3 2.8</th> <th>+ 0 49 49</th> <th>+0.5669</th> <th>.5127</th> <th>+2268</th> <th>-9.2792</th> <th>.9920</th>	6	+73 -12	3 2.8	+ 0 49 49	+0.5669	.5127	+2268	-9.2792	.9920
	13	δ Aquarii <td>4½</td> <th>+82 - 5</th> <th>15 20.9</th> <th>-11 13 24</th> <th>+0.6974</th> <th>.5065</th> <th>+2337</th> <th>-9.1684</th> <th>.9952</th>	4½	+82 - 5	15 20.9	-11 13 24	+0.6974	.5065	+2337	-9.1684	.9952
	13	ε Aquarii <td>5½</td> <th>+82 +26</th> <th>17 9.5</th> <th>- 9 27 52</th> <th>+1.1682</th> <th>.5054</th> <th>+2346</th> <th>-9.1705</th> <th>.9952</th>	5½	+82 +26	17 9.5	- 9 27 52	+1.1682	.5054	+2346	-9.1705	.9952
	14	α Aquarii <td>5</td> <th>+16 -71</th> <th>2 42.0</th> <th>- 0 11 34</th> <th>-0.4792</th> <th>.5011</th> <th>+2381</th> <th>-8.9353</th> <th>9.9984</th>	5	+16 -71	2 42.0	- 0 11 34	-0.4792	.5011	+2381	-8.9353	9.9984
	15	α Piscium <td>4½</td> <th>+45 -38</th> <th>5 53.4</th> <th>+ 2 15 3</th> <th>+0.0685</th> <th>.4940</th> <th>+2403</th> <th>+7.9375</th> <th>0.0000</th>	4½	+45 -38	5 53.4	+ 2 15 3	+0.0685	.4940	+2403	+7.9375	0.0000
	15	9 Piscium <td>6</td> <th>+56 -27</th> <th>6 4.0</th> <th>+ 2 25 20</th> <th>+0.2614</th> <th>.4940</th> <th>+2404</th> <th>+7.7978</th> <th>0.0000</th>	6	+56 -27	6 4.0	+ 2 25 20	+0.2614	.4940	+2404	+7.7978	0.0000
	15	16 Piscium <td>6</td> <th>+66 -19</th> <th>11 11.3</th> <th>+ 7 24 19</th> <th>+0.4160</th> <th>.4934</th> <th>+2394</th> <th>+8.3668</th> <th>9.9999</th>	6	+66 -19	11 11.3	+ 7 24 19	+0.4160	.4934	+2394	+8.3668	9.9999
	16	d Piscium <td>5½</td> <th>+16 -70</th> <th>11 50.7</th> <th>+ 7 23 40</th> <th>-0.4972</th> <th>.4915</th> <th>+2400</th> <th>+9.1111</th> <th>.9964</th>	5½	+16 -70	11 50.7	+ 7 23 40	-0.4972	.4915	+2400	+9.1111	.9964
	18	γ Piscium <td>4</td> <th>+36 -42</th> <th>2 12.8</th> <th>- 3 18 33</th> <th>-0.1080</th> <th>.5068</th> <th>+2014</th> <th>+9.4023</th> <th>.9857</th>	4	+36 -42	2 12.8	- 3 18 33	-0.1080	.5068	+2014	+9.4023	.9857
	19	δ Arietis <td>5½</td> <th>+ 2 -71</th> <th>2 3.1</th> <th>- 4 10 41</th> <th>-0.7183</th> <th>.5204</th> <th>+1732</th> <th>+9.5183</th> <th>.9750</th>	5½	+ 2 -71	2 3.1	- 4 10 41	-0.7183	.5204	+1732	+9.5183	.9750
	19	26 Arietis <td>6½</td> <th>+63 -13</th> <th>8 14.0</th> <th>+ 1 48 46</th> <th>+0.3470</th> <th>.5246</th> <th>+1644</th> <th>+9.5178</th> <th>.9751</th>	6½	+63 -13	8 14.0	+ 1 48 46	+0.3470	.5246	+1644	+9.5178	.9751
	19	μ Arietis <td>5½</td> <th>+90 +30</th> <th>13 57.0</th> <th>+ 7 21 1</th> <th>+1.0610</th> <th>.5284</th> <th>+1554</th> <th>+9.5218</th> <th>.9746</th>	5½	+90 +30	13 57.0	+ 7 21 1	+1.0610	.5284	+1554	+9.5218	.9746
	19	α Arietis <td>4½</td> <th>+90 +12</th> <th>21 59.7</th> <th>- 8 51 45</th> <th>+0.7628</th> <th>.5340</th> <th>+1421</th> <th>+9.5500</th> <th>.9708</th>	4½	+90 +12	21 59.7	- 8 51 45	+0.7628	.5340	+1421	+9.5500	.9708
	20	66 Arietis <td>6½</td> <th>+90 +19</th> <th>11 34.3</th> <th>+ 4 16 2</th> <th>+0.8410</th> <th>.5438</th> <th>+1168</th> <th>+9.5797</th> <th>.9661</th>	6½	+90 +19	11 34.3	+ 4 16 2	+0.8410	.5438	+1168	+9.5797	.9661
	20	9 Tauri <td>6</td> <th>+90 +19</th> <th>15 26.5</th> <th>+ 8 0 25</th> <th>+0.8160</th> <th>.5446</th> <th>+1090</th> <th>+9.5874</th> <th>.9648</th>	6	+90 +19	15 26.5	+ 8 0 25	+0.8160	.5446	+1090	+9.5874	.9648
	20	g Pleiadum <td>5½</td> <th>+42 -24</th> <th>18 57.3</th> <th>+11 24 3</th> <th>+0.0064</th> <th>.5491</th> <th>+1020</th> <th>+9.6068</th> <th>.9612</th>	5½	+42 -24	18 57.3	+11 24 3	+0.0064	.5491	+1020	+9.6068	.9612
	20	b Pleiadum <td>4½</td> <th>+53 -14</th> <th>18 59.4</th> <th>+11 26 8</th> <th>+0.1877</th> <th>.5491</th> <th>+1019</th> <th>+9.6037</th> <th>.9618</th>	4½	+53 -14	18 59.4	+11 26 8	+0.1877	.5491	+1019	+9.6037	.9618
	20	m Pleiadum <td>7</td> <th>+ 6 -58</th> <th>19 6.0</th> <th>+11 32 27</th> <th>-0.5858</th> <th>.5492</th> <th>+1016</th> <th>+9.6161</th> <th>.9594</th>	7	+ 6 -58	19 6.0	+11 32 27	-0.5858	.5492	+1016	+9.6161	.9594
	20	e Pleiadum <td>5</td> <th>+32 -34</th> <th>19 7.8</th> <th>+11 34 15</th> <th>-0.1818</th> <th>.5492</th> <th>+1016</th> <th>+9.6099</th> <th>.9606</th>	5	+32 -34	19 7.8	+11 34 15	-0.1818	.5492	+1016	+9.6099	.9606
	20	1 Pleiadum <td>8</td> <th>+60 - 9</th> <th>19 14.7</th> <th>+11 40 51</th> <th>+0.2968</th> <th>.5493</th> <th>+1013</th> <th>+9.6024</th> <th>.9621</th>	8	+60 - 9	19 14.7	+11 40 51	+0.2968	.5493	+1013	+9.6024	.9621
	20	2 Pleiadum <td>8½</td> <th>+33 -33</th> <th>19 17.6</th> <th>+11 43 48</th> <th>-0.1621</th> <th>.5493</th> <th>+1012</th> <th>+9.6098</th> <th>.9606</th>	8½	+33 -33	19 17.6	+11 43 48	-0.1621	.5493	+1012	+9.6098	.9606
	20	3 Pleiadum <td>9</td> <th>+57 -11</th> <th>19 18.7</th> <th>+11 44 43</th> <th>+0.2511</th> <th>.5493</th> <th>+1012</th> <th>+9.6032</th> <th>.9619</th>	9	+57 -11	19 18.7	+11 44 43	+0.2511	.5493	+1012	+9.6032	.9619
	20	4 Pleiadum <td>8</td> <th>+41 -25</th> <th>19 19.4</th> <th>+11 45 24</th> <th>-0.0209</th> <th>.5494</th> <th>+1011</th> <th>+9.6076</th> <th>.9611</th>	8	+41 -25	19 19.4	+11 45 24	-0.0209	.5494	+1011	+9.6076	.9611
	20	5 Pleiadum <td>9</td> <th>+23 -42</th> <th>19 20.0</th> <th>+11 46 1</th> <th>-0.3355</th> <th>.5494</th> <th>+1011</th> <th>+9.6125</th> <th>.9601</th>	9	+23 -42	19 20.0	+11 46 1	-0.3355	.5494	+1011	+9.6125	.9601
	20	6 Pleiadum <td>9</td> <th>+43 -23</th> <th>19 21.1</th> <th>+11 47 0</th> <th>+0.0263</th> <th>.5494</th> <th>+1011</th> <th>+9.6068</th> <th>.9612</th>	9	+43 -23	19 21.1	+11 47 0	+0.0263	.5494	+1011	+9.6068	.9612
	20	c Pleiadum <td>5</td> <th>+30 -27</th> <th>19 24.6</th> <th>+11 50 27</th> <th>-0.0478</th> <th>.5495</th> <th>+1009</th> <th>+9.6082</th> <th>.9610</th>	5	+30 -27	19 24.6	+11 50 27	-0.0478	.5495	+1009	+9.6082	.9610
	20	7 Pleiadum <td>8</td> <th>+61 - 8</th> <th>19 26.0</th> <th>+11 51 48</th> <th>+0.3105</th> <th>.5495</th> <th>+1009</th> <th>+9.6025</th> <th>.9621</th>	8	+61 - 8	19 26.0	+11 51 48	+0.3105	.5495	+1009	+9.6025	.9621
	20	B.A.C. 1155 <td>7</td> <th>+90 +59</th> <th>19 26.2</th> <th>+11 51 59</th> <th>+1.2761</th> <th>.5495</th> <th>+1009</th> <th>+9.5866</th> <th>.9650</th>	7	+90 +59	19 26.2	+11 51 59	+1.2761	.5495	+1009	+9.5866	.9650
	20	k Pleiadum <td>7½</td> <th>+28 -37</th> <th>19 26.5</th> <th>+11 52 16</th> <th>-0.2462</th> <th>.5495</th> <th>+1009</th> <th>+9.6113</th> <th>.9603</th>	7½	+28 -37	19 26.5	+11 52 16	-0.2462	.5495	+1009	+9.6113	.9603
	20	l Pleiadum <td>7½</td> <th>+30 -35</th> <th>19 30.3</th> <th>+11 55 58</th> <th>-0.2111</th> <th>.5496</th> <th>+1007</th> <th>+9.6108</th> <th>.9604</th>	7½	+30 -35	19 30.3	+11 55 58	-0.2111	.5496	+1007	+9.6108	.9604
	20	8 Pleiadum <td>8½</td> <th>+51 -16</th> <th>19 35.7</th> <th>-11 58 50</th> <th>+0.1570</th> <th>.5496</th> <th>+1005</th> <th>+9.6051</th> <th>.9616</th>	8½	+51 -16	19 35.7	-11 58 50	+0.1570	.5496	+1005	+9.6051	.9616
	20	9 Pleiadum <td>8½</td> <th>+52 -15</th> <th>19 36.8</th> <th>-11 57 49</th> <th>+0.1644</th> <th>.5496</th> <th>+1005</th> <th>+9.6051</th> <th>.9616</th>	8½	+52 -15	19 36.8	-11 57 49	+0.1644	.5496	+1005	+9.6051	.9616
	20	d Pleiadum <td>5</td> <th>+70 - 2</th> <th>19 38.7</th> <th>-11 55 56</th> <th>+0.4282</th> <th>.5496</th> <th>+1004</th> <th>+9.6010</th> <th>.9623</th>	5	+70 - 2	19 38.7	-11 55 56	+0.4282	.5496	+1004	+9.6010	.9623
	20	10 Pleiadum <td>8</td> <th>+48 -19</th> <th>19 41.7</th> <th>-11 53 3</th> <th>+0.1016</th> <th>.5496</th> <th>+1004</th> <th>+9.6063</th> <th>.9613</th>	8	+48 -19	19 41.7	-11 53 3	+0.1016	.5496	+1004	+9.6063	.9613
	20	11 Pleiadum <td>8½</td> <th>+59 -10</th> <th>19 47.4</th> <th>-11 47 36</th> <th>+0.2747</th> <th>.5497</th> <th>+1002</th> <th>+9.6037</th> <th>.9618</th>	8½	+59 -10	19 47.4	-11 47 36	+0.2747	.5497	+1002	+9.6037	.9618
	20	12 Pleiadum <td>7½</td> <th>+32 -33</th> <th>19 55.7</th> <th>-11 39 30</th> <th>-0.1632</th> <th>.5497</th> <th>+0999</th> <th>+9.6108</th> <th>.9604</th>	7½	+32 -33	19 55.7	-11 39 30	-0.1632	.5497	+0999	+9.6108	.9604
	20	13 Pleiadum <td>8</td> <th>+68 - 3</th> <th>19 58.6</th> <th>-11 36 42</th> <th>+0.4089</th> <th>.5497</th> <th>+0998</th> <th>+9.6019</th> <th>.9622</th>	8	+68 - 3	19 58.6	-11 36 42	+0.4089	.5497	+0998	+9.6019	.9622
	20	14 Pleiadum <td>9</td> <th>+90 +11</th> <th>20 1.3</th> <th>-11 34 8</th> <th>+0.6610</th> <th>.5497</th> <th>+0998</th> <th>+9.5978</th> <th>.9629</th>	9	+90 +11	20 1.3	-11 34 8	+0.6610	.5497	+0998	+9.5978	.9629
	20	15 Pleiadum <td>8½</td> <th>+59 -10</th> <th>20 4.0</th> <th>-11 31 32</th> <th>+0.2734</th> <th>.5497</th> <th>+0997</th> <th>+9.6042</th> <th>.9617</th>	8½	+59 -10	20 4.0	-11 31 32	+0.2734	.5497	+0997	+9.6042	.9617
	20	16 Pleiadum <td>9½</td> <th>+86 + 8</th> <th>20 4.5</th> <th>-11 31 2</th> <th>+0.6102</th> <th>.05497</th> <th>+0997</th> <th>+9.5987</th> <th>9.9628</th>	9½	+86 + 8	20 4.5	-11 31 2	+0.6102	.05497	+0997	+9.5987	9.9628

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
					h m	h m s					
Jan. 20	17 Pleiadum	8	+90	+13	20 5.1	-11 30 29	+0.7103	0.5497	+0.0997	+9.5970	9.9631
20	18 Pleiadum	8	+58	-10	20 5.2	-11 30 21	+0.2635	.5497	+0.0997	+9.6043	.9617
20	p Pleiadum	7½	+60	-9	20 6.0	-11 29 34	+0.2396	.5498	+0.0997	+9.6039	.9618
20	19 Pleiadum	8	+89	+9	20 6.4	-11 29 12	+0.6287	.5498	+0.0996	+9.5984	.9628
20	20 Pleiadum	8	+30	-36	20 6.7	-11 28 56	-0.2202	.5498	+0.0996	+9.6120	.9602
20	22 Pleiadum	8	+76	+3	20 7.7	-11 27 54	+0.5101	.5498	+0.0996	+9.6004	.9625
20	21 Pleiadum	8½	+26	-39	20 7.8	-11 27 53	-0.2925	.5498	+0.0996	+9.6132	.9600
20	23 Pleiadum	8½	+90	+17	20 9.2	-11 26 30	+0.7681	.5498	+0.0996	+9.5963	.9632
20	24 Pleiadum	8	+48	-18	20 9.5	-11 26 11	+0.1086	.5498	+0.0995	+9.6069	.9612
20	γ Tauri	3½	+61	-8	20 9.6	-11 26 8	+0.3067	.5498	+0.0995	+9.6037	.9618
20	25 Pleiadum	8½	+90	+22	20 13.7	-11 22 12	+0.8490	.5498	+0.0995	+9.5950	.9635
20	26 Pleiadum	9	+90	+27	20 16.4	-11 19 36	+0.9255	.5498	+0.0993	+9.5940	.9636
20	27 Pleiadum	8½	+49	-17	20 29.2	-11 7 12	+0.1245	.5499	+0.0989	+9.6071	.9612
20	28 Pleiadum	7	+90	+38	20 33.7	-11 2 49	+1.0832	.5499	+0.0987	+9.5918	.9641
20	29 Pleiadum	8	+47	-19	20 36.6	-11 0 4	+0.0885	.5500	+0.0996	+9.6079	.9610
20	s Pleiadum	7½	+72	0	20 49.1	-10 47 57	+0.4548	.5501	+0.0982	+9.6024	.9631
20	f Pleiadum	4½	+70	-1	20 54.7	-10 42 31	+0.4317	.5502	+0.0980	+9.6028	.9630
20	h Pleiadum	5½	+64	-6	20 55.3	-10 41 59	+0.3431	.5502	+0.0979	+9.6043	.9617
20	30 Pleiadum	5½	+70	-1	20 56.1	-10 41 16	+0.4337	.5502	+0.0979	+9.6028	.9620
20	31 Pleiadum	8	+46	-20	20 57.4	-10 39 57	+0.0655	.5502	+0.0979	+9.6087	.9608
20	32 Pleiadum	8	+47	-19	20 59.6	-10 37 48	+0.0852	.5503	+0.0978	+9.6086	.9609
20	33 Pleiadum	8½	+56	-12	21 1.7	-10 35 48	+0.2324	.5503	+0.0977	+9.6063	.9613
20	34 Pleiadum	7½	+90	+20	21 10.3	-10 27 31	+0.8245	.5504	+0.0974	+9.6970	.9631
20	35 Pleiadum	9	+57	-11	21 10.7	-10 27 7	+0.2536	.5505	+0.0973	+9.6063	.9613
20	36 Pleiadum	9	+60	-9	21 14.7	-10 23 18	+0.2854	.5506	+0.0971	+9.6057	.9615
20	37 Pleiadum	8	+50	-16	21 15.3	-10 22 44	+0.1434	.5506	+0.0971	+9.6080	.9610
20	B.A.C. 1192	6½	-35	-65	21 23.5	-10 14 46	-1.1752	.5507	+0.0968	+9.6285	.9567
20	39 Pleiadum	8	+42	-23	21 28.9	-10 9 35	+0.0063	.5508	+0.0966	+9.6105	.9605
20	40 Pleiadum	7½	+86	+8	21 40.7	-9 58 10	+0.6033	.5509	+0.0961	+9.6014	.9623
21	36 Tauri	0½	+90	+29	3 39.2	-4 12 8	+0.9390	.5565	+0.0832	+9.6045	.9617
21	χ Tauri	5½	+32	-30	11 33.7	+3 25 36	-0.1758	.5628	+0.0652	+9.6308	.9562
21	139 Tauri	5½	+27	-30	3 29.1	-6 7 38	-0.2582	.5777	-0.0378	+9.6408	.9539
23	5 Geminor.	6	+90	+40	9 3.5	-0 45 58	+1.0462	.5786	-0.0525	+9.6169	.9592
23	s Geminor.	3½	0	-65	22 14.6	+11 55 55	-0.7331	.5795	-0.0875	+9.6303	.9563
24	44 Geminor.	6½	+90	+25	7 1.9	-3 37 55	+0.9024	.5789	-1.1104	+9.5891	.9646
24	δ Geminor.	3½	+90	+17	13 7.1	+2 13 26	+0.8060	.5780	-1.258	+9.5779	.9654
24	63 Geminor.	5½	+90	+23	16 15.9	+5 15 0	+0.9170	.5768	-1.359	+9.5683	.9680
25	B.A.C. 2683	6	+90	+35	7 39.9	-3 55 42	+1.1264	.5731	-1.692	+9.5177	.9751
25	d¹ Cancri	6	+54	-22	15 29.6	+3 36 37	+0.1987	.5703	-1.857	+9.5076	.9763
25	d² Cancri	6	+90	+51	16 34.2	+4 38 54	+1.2918	.5699	-1.878	+9.4781	.9794
26	o¹ Cancri	6	+58	-21	5 59.4	-6 25 20	+0.2701	.5648	-2.120	+9.4364	.9832
26	o² Cancri	6	+41	-36	6 8.2	-6 16 47	-0.0220	.5648	-2.123	+9.4432	.9826
27	o Leonis	3½	+90	+39	1 14.7	-11 51 4	+1.2682	.5575	-2.295	+9.2615	.9926
27	B.A.C. 3398	6	+77	-11	8 1.9	-5 18 3	+0.5518	.5547	-2.468	+9.2214	.9939
27	B.A.C. 3407	6	+90	+14	8 47.2	-4 34 20	+0.9802	.5543	-2.475	+9.1930	.9947
27	π Leonis	5	+90	+16	9 43.4	-3 40 4	+1.0141	.5542	-2.485	+9.1801	.9950
27	B.A.C. 3529	6	+58	-28	18 51.2	+5 8 48	+0.2403	.5516	-2.561	+9.0835	.9966
28	34 Sextantis	6	+73	-15	4 52.3	-9 10 39	+0.5129	.5492	-2.620	+8.8753	.9988
28	p¹ Leonis	5	+64	-22	10 4.3	+4 32 32	-0.3787	.5470	-2.656	+8.0760	0.0000
29	e Leonis	5	+88	+36	2 38.2	+11 51 6	+1.2897	.5465	-2.656	-8.5921	9.9997
29	B.A.C. 4006	6	+86	+20	12 6.1	-3 0 9	+1.1092	.5465	-2.628	-8.9006	.9986
31	69 Virginis	5½	+75	+26	7 18.2	-9 17 1	+1.1505	.5562	-2.244	-9.4201	.9844
31	87 Virginis	6	+73	+31	15 57.7	-0 56 0	+1.1954	.5595	-2.111	-9.4700	.9802
31	89 Virginis	5½	+73	+37	17 1.6	+0 5 40	+1.2520	.5602	-2.094	-9.4767	.9796
Feb. 2	42 Libræ	5½	+11	-58	15 1.3	-3 36 46	-0.2627	0.5646	-1.124	-9.5963	9.9628

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
Feb.	2	B.A.C. 5197	6	+49	-17	h m	h m s	+0.4479	0.5781	-.1069	-9.6139	9.9598
	2 <td>A Scorpii<th>5</th><th>+65</th><th>+2</th><th>20 23.0</th><th>+1 32 32</th><th>+0.7633</th><th>.5795</th><th>-.0980</th><th>-9.6244</th><th>.9576</th></td>	A Scorpii <th>5</th> <th>+65</th> <th>+2</th> <th>20 23.0</th> <th>+1 32 32</th> <th>+0.7633</th> <th>.5795</th> <th>-.0980</th> <th>-9.6244</th> <th>.9576</th>	5	+65	+2	20 23.0	+1 32 32	+0.7633	.5795	-.0980	-9.6244	.9576
	2 <td>3 Scorpii<th>6</th><th>+61</th><th>-6</th><th>20 49.0</th><th>+1 57 37</th><th>+0.6404</th><th>.5797</th><th>-.0973</th><th>-9.6232</th><th>.9579</th></td>	3 Scorpii <th>6</th> <th>+61</th> <th>-6</th> <th>20 49.0</th> <th>+1 57 37</th> <th>+0.6404</th> <th>.5797</th> <th>-.0973</th> <th>-9.6232</th> <th>.9579</th>	6	+61	-6	20 49.0	+1 57 37	+0.6404	.5797	-.0973	-9.6232	.9579
	3 <td>19 Scorpii<th>5½</th><th>-61</th><th>-90</th><th>7 16.8</th><th>-11 58 50</th><th>-1.2671</th><th>.5813</th><th>-.0699</th><th>-9.6065</th><th>.9613</th></td>	19 Scorpii <th>5½</th> <th>-61</th> <th>-90</th> <th>7 16.8</th> <th>-11 58 50</th> <th>-1.2671</th> <th>.5813</th> <th>-.0699</th> <th>-9.6065</th> <th>.9613</th>	5½	-61	-90	7 16.8	-11 58 50	-1.2671	.5813	-.0699	-9.6065	.9613
	3 <td>σ Scorpii<th>3½</th><th>+31</th><th>-31</th><th>7 28.2</th><th>-11 47 57</th><th>+0.1929</th><th>.5816</th><th>-.0688</th><th>-9.6301</th><th>.9564</th></td>	σ Scorpii <th>3½</th> <th>+31</th> <th>-31</th> <th>7 28.2</th> <th>-11 47 57</th> <th>+0.1929</th> <th>.5816</th> <th>-.0688</th> <th>-9.6301</th> <th>.9564</th>	3½	+31	-31	7 28.2	-11 47 57	+0.1929	.5816	-.0688	-9.6301	.9564
	3 <td>ε Scorpii<th>1½</th><th>+65</th><th>+10</th><th>10 44.6</th><th>-8 39 3</th><th>+0.8752</th><th>.5818</th><th>-.0602</th><th>-9.6437</th><th>.9532</th></td>	ε Scorpii <th>1½</th> <th>+65</th> <th>+10</th> <th>10 44.6</th> <th>-8 39 3</th> <th>+0.8752</th> <th>.5818</th> <th>-.0602</th> <th>-9.6437</th> <th>.9532</th>	1½	+65	+10	10 44.6	-8 39 3	+0.8752	.5818	-.0602	-9.6437	.9532
	3 <td>22 Scorpii<th>5</th><th>-7</th><th>-77</th><th>11 5.8</th><th>-8 18 43</th><th>-0.5062</th><th>.5817</th><th>-.0593</th><th>-9.6323</th><th>.9580</th></td>	22 Scorpii <th>5</th> <th>-7</th> <th>-77</th> <th>11 5.8</th> <th>-8 18 43</th> <th>-0.5062</th> <th>.5817</th> <th>-.0593</th> <th>-9.6323</th> <th>.9580</th>	5	-7	-77	11 5.8	-8 18 43	-0.5062	.5817	-.0593	-9.6323	.9580
	4 <td>A Ophiuchi<th>5</th><th>+46</th><th>-12</th><th>5 11.6</th><th>+9 4 59</th><th>+0.5189</th><th>.5816</th><th>-.0104</th><th>-9.6478</th><th>.9522</th></td>	A Ophiuchi <th>5</th> <th>+46</th> <th>-12</th> <th>5 11.6</th> <th>+9 4 59</th> <th>+0.5189</th> <th>.5816</th> <th>-.0104</th> <th>-9.6478</th> <th>.9522</th>	5	+46	-12	5 11.6	+9 4 59	+0.5189	.5816	-.0104	-9.6478	.9522
	4 <td>δ Ophiuchi<th>3½</th><th>-48</th><th>-90</th><th>7 52.9</th><th>+11 40 6</th><th>-1.0090</th><th>.5812</th><th>-.0022</th><th>-9.6236</th><th>.9578</th></td>	δ Ophiuchi <th>3½</th> <th>-48</th> <th>-90</th> <th>7 52.9</th> <th>+11 40 6</th> <th>-1.0090</th> <th>.5812</th> <th>-.0022</th> <th>-9.6236</th> <th>.9578</th>	3½	-48	-90	7 52.9	+11 40 6	-1.0090	.5812	-.0022	-9.6236	.9578
	5 <td>λ Sagittarii<th>3</th><th>+48</th><th>-15</th><th>10 49.8</th><th>-10 24 30</th><th>+0.4838</th><th>.5727</th><th>+0.0693</th><th>-9.6338</th><th>.9555</th></td>	λ Sagittarii <th>3</th> <th>+48</th> <th>-15</th> <th>10 49.8</th> <th>-10 24 30</th> <th>+0.4838</th> <th>.5727</th> <th>+0.0693</th> <th>-9.6338</th> <th>.9555</th>	3	+48	-15	10 49.8	-10 24 30	+0.4838	.5727	+0.0693	-9.6338	.9555
	5 <td>B.A.C. 6369<th>6</th><th>+63</th><th>-4</th><th>17 54.6</th><th>-3 35 24</th><th>+0.6740</th><th>.5690</th><th>+0.0667</th><th>-9.6284</th><th>.9567</th></td>	B.A.C. 6369 <th>6</th> <th>+63</th> <th>-4</th> <th>17 54.6</th> <th>-3 35 24</th> <th>+0.6740</th> <th>.5690</th> <th>+0.0667</th> <th>-9.6284</th> <th>.9567</th>	6	+63	-4	17 54.6	-3 35 24	+0.6740	.5690	+0.0667	-9.6284	.9567
	7 <td>VENUS<th></th><th>+63</th><th>-11</th><th>2 51.5</th><th>+4 11 31</th><th>+0.5696</th><th>.4935</th><th>+0.1658</th><th>-9.5586</th><th>.9695</th></td>	VENUS <th></th> <th>+63</th> <th>-11</th> <th>2 51.5</th> <th>+4 11 31</th> <th>+0.5696</th> <th>.4935</th> <th>+0.1658</th> <th>-9.5586</th> <th>.9695</th>		+63	-11	2 51.5	+4 11 31	+0.5696	.4935	+0.1658	-9.5586	.9695
	7 <td>σ Capricor.<th>5½</th><th>+47</th><th>-26</th><th>12 0.3</th><th>-10 57 55</th><th>+0.2926</th><th>.5420</th><th>+0.1723</th><th>-9.5246</th><th>.9742</th></td>	σ Capricor. <th>5½</th> <th>+47</th> <th>-26</th> <th>12 0.3</th> <th>-10 57 55</th> <th>+0.2926</th> <th>.5420</th> <th>+0.1723</th> <th>-9.5246</th> <th>.9742</th>	5½	+47	-26	12 0.3	-10 57 55	+0.2926	.5420	+0.1723	-9.5246	.9742
	7 <td>π Capricor.<th>5</th><th>+32</th><th>-42</th><th>15 45.1</th><th>-7 20 30</th><th>-0.0021</th><th>.5394</th><th>+0.1782</th><th>-9.5050</th><th>.9766</th></td>	π Capricor. <th>5</th> <th>+32</th> <th>-42</th> <th>15 45.1</th> <th>-7 20 30</th> <th>-0.0021</th> <th>.5394</th> <th>+0.1782</th> <th>-9.5050</th> <th>.9766</th>	5	+32	-42	15 45.1	-7 20 30	-0.0021	.5394	+0.1782	-9.5050	.9766
	7 <td>ε Capricor.<th>5</th><th>+17</th><th>-59</th><th>16 29.5</th><th>-6 37 34</th><th>-0.2903</th><th>.5389</th><th>+0.1795</th><th>-9.4963</th><th>.9775</th></td>	ε Capricor. <th>5</th> <th>+17</th> <th>-59</th> <th>16 29.5</th> <th>-6 37 34</th> <th>-0.2903</th> <th>.5389</th> <th>+0.1795</th> <th>-9.4963</th> <th>.9775</th>	5	+17	-59	16 29.5	-6 37 34	-0.2903	.5389	+0.1795	-9.4963	.9775
	7 <td>o Capricor.<th>6</th><th>+68</th><th>-8</th><th>16 57.7</th><th>-6 10 13</th><th>+0.6208</th><th>.5388</th><th>+0.1801</th><th>-9.5134</th><th>.9756</th></td>	o Capricor. <th>6</th> <th>+68</th> <th>-8</th> <th>16 57.7</th> <th>-6 10 13</th> <th>+0.6208</th> <th>.5388</th> <th>+0.1801</th> <th>-9.5134</th> <th>.9756</th>	6	+68	-8	16 57.7	-6 10 13	+0.6208	.5388	+0.1801	-9.5134	.9756
	10 <td>α Aquarii<th>5</th><th>+13</th><th>-75</th><th>10 32.7</th><th>+9 26 57</th><th>-0.5346</th><th>.5024</th><th>+0.2381</th><th>-8.9362</th><th>9.9984</th></td>	α Aquarii <th>5</th> <th>+13</th> <th>-75</th> <th>10 32.7</th> <th>+9 26 57</th> <th>-0.5346</th> <th>.5024</th> <th>+0.2381</th> <th>-8.9362</th> <th>9.9984</th>	5	+13	-75	10 32.7	+9 26 57	-0.5346	.5024	+0.2381	-8.9362	9.9984
	11 <td>π Piscium<th>4½</th><th>+41</th><th>-42</th><th>13 38.7</th><th>+11 48 6</th><th>-0.0086</th><th>.4964</th><th>+0.2406</th><th>-7.9371</th><th>0.0000</th></td>	π Piscium <th>4½</th> <th>+41</th> <th>-42</th> <th>13 38.7</th> <th>+11 48 6</th> <th>-0.0086</th> <th>.4964</th> <th>+0.2406</th> <th>-7.9371</th> <th>0.0000</th>	4½	+41	-42	13 38.7	+11 48 6	-0.0086	.4964	+0.2406	-7.9371	0.0000
	12 <td>d Piscium<th>5½</th><th>+11</th><th>-77</th><th>19 29.1</th><th>-7 10 13</th><th>-0.5964</th><th>.4966</th><th>+0.2314</th><th>-9.1113</th><th>9.9964</th></td>	d Piscium <th>5½</th> <th>+11</th> <th>-77</th> <th>19 29.1</th> <th>-7 10 13</th> <th>-0.5964</th> <th>.4966</th> <th>+0.2314</th> <th>-9.1113</th> <th>9.9964</th>	5½	+11	-77	19 29.1	-7 10 13	-0.5964	.4966	+0.2314	-9.1113	9.9964
	14 <td>η Piscium<th>4</th><th>+30</th><th>-48</th><th>9 52.1</th><th>+6 8 30</th><th>-0.2242</th><th>.5070</th><th>+0.2015</th><th>-9.4023</th><th>.9857</th></td>	η Piscium <th>4</th> <th>+30</th> <th>-48</th> <th>9 52.1</th> <th>+6 8 30</th> <th>-0.2242</th> <th>.5070</th> <th>+0.2015</th> <th>-9.4023</th> <th>.9857</th>	4	+30	-48	9 52.1	+6 8 30	-0.2242	.5070	+0.2015	-9.4023	.9857
	14	101 Piscium <th>6</th> <th>+90</th> <th>+18</th> <th>12 8.3</th> <th>+8 20 47</th> <th>+0.9826</th> <th>.5080</th> <th>+0.1992</th> <th>-9.3822</th> <th>.9870</th>	6	+90	+18	12 8.3	+8 20 47	+0.9826	.5080	+0.1992	-9.3822	.9870
	15	δ Arietis <th>5½</th> <th>-6</th> <th>-71</th> <th>9 52.7</th> <th>+5 26 36</th> <th>-0.8466</th> <th>.5186</th> <th>+0.1723</th> <th>-9.5183</th> <th>.9750</th>	5½	-6	-71	9 52.7	+5 26 36	-0.8466	.5186	+0.1723	-9.5183	.9750
	15	μ Arietis <th>5½</th> <th>+90</th> <th>+21</th> <th>21 55.2</th> <th>-6 52 58</th> <th>+0.9428</th> <th>.5253</th> <th>+0.1543</th> <th>-9.5217</th> <th>.9746</th>	5½	+90	+21	21 55.2	-6 52 58	+0.9428	.5253	+0.1543	-9.5217	.9746
	16	47 Arietis <th>6</th> <th>+90</th> <th>+60</th> <th>5 32.0</th> <th>+0 29 25</th> <th>+1.3077</th> <th>.5301</th> <th>+0.1417</th> <th>-9.5362</th> <th>.9727</th>	6	+90	+60	5 32.0	+0 29 25	+1.3077	.5301	+0.1417	-9.5362	.9727
	16	α Arietis <th>4½</th> <th>+89</th> <th>+5</th> <th>6 4.8</th> <th>+1 1 15</th> <th>+0.6428</th> <th>.5301</th> <th>+0.1409</th> <th>-9.5500</th> <th>.9708</th>	4½	+89	+5	6 4.8	+1 1 15	+0.6428	.5301	+0.1409	-9.5500	.9708
	17	g Pleiadum <th>5½</th> <th>+34</th> <th>-31</th> <th>3 25.1</th> <th>-2 20 18</th> <th>-0.1304</th> <th>.5433</th> <th>+0.1007</th> <th>-9.6068</th> <th>.9612</th>	5½	+34	-31	3 25.1	-2 20 18	-0.1304	.5433	+0.1007	-9.6068	.9612
	17	b Pleiadum <th>4½</th> <th>+46</th> <th>-21</th> <th>3 27.3</th> <th>-2 18 11</th> <th>+0.0652</th> <th>.5433</th> <th>+0.1006</th> <th>-9.6037</th> <th>.9618</th>	4½	+46	-21	3 27.3	-2 18 11	+0.0652	.5433	+0.1006	-9.6037	.9618
	17	m Pleiadum <th>8</th> <th>+1</th> <th>-66</th> <th>3 34.1</th> <th>-2 11 36</th> <th>-0.7172</th> <th>.5434</th> <th>+0.1005</th> <th>-9.6161</th> <th>.9694</th>	8	+1	-66	3 34.1	-2 11 36	-0.7172	.5434	+0.1005	-9.6161	.9694
	17	e Pleiadum <th>5</th> <th>+25</th> <th>-41</th> <th>3 35.4</th> <th>-2 10 20</th> <th>-0.3080</th> <th>.5434</th> <th>+0.1004</th> <th>-9.6098</th> <th>.9606</th>	5	+25	-41	3 35.4	-2 10 20	-0.3080	.5434	+0.1004	-9.6098	.9606
	17	1 Pleiadum <th>8</th> <th>+52</th> <th>-15</th> <th>3 42.9</th> <th>-2 3 7</th> <th>+0.1753</th> <th>.5434</th> <th>+0.1002</th> <th>-9.6024</th> <th>.9621</th>	8	+52	-15	3 42.9	-2 3 7	+0.1753	.5434	+0.1002	-9.6024	.9621
	17	2 Pleiadum <th>8½</th> <th>+26</th> <th>-40</th> <th>3 45.9</th> <th>-2 0 10</th> <th>-0.2870</th> <th>.5434</th> <th>+0.1001</th> <th>-9.6097</th> <th>.9607</th>	8½	+26	-40	3 45.9	-2 0 10	-0.2870	.5434	+0.1001	-9.6097	.9607
	17	3 Pleiadum <th>9</th> <th>+50</th> <th>-17</th> <th>3 47.0</th> <th>-1 59 9</th> <th>+0.1294</th> <th>.5434</th> <th>+0.1001</th> <th>-9.6033</th> <th>.9619</th>	9	+50	-17	3 47.0	-1 59 9	+0.1294	.5434	+0.1001	-9.6033	.9619
	17	4 Pleiadum <th>8</th> <th>+34</th> <th>-32</th> <th>3 47.7</th> <th>-1 58 28</th> <th>-0.1445</th> <th>.5434</th> <th>+0.1001</th> <th>-9.6076</th> <th>.9611</th>	8	+34	-32	3 47.7	-1 58 28	-0.1445	.5434	+0.1001	-9.6076	.9611
	17	5 Pleiadum <th>9</th> <th>+16</th> <th>-50</th> <th>3 48.3</th> <th>-1 57 50</th> <th>-0.4621</th> <th>.5434</th> <th>+0.1001</th> <th>-9.6125</th> <th>.9601</th>	9	+16	-50	3 48.3	-1 57 50	-0.4621	.5434	+0.1001	-9.6125	.9601
	17	6 Pleiadum <th>9</th> <th>+37</th> <th>-29</th> <th>3 49.2</th> <th>-1 57 2</th> <th>-0.0973</th> <th>.5434</th> <th>+0.1001</th> <th>-9.6069</th> <th>.9612</th>	9	+37	-29	3 49.2	-1 57 2	-0.0973	.5434	+0.1001	-9.6069	.9612
	17	c Pleiadum <th>5</th> <th>+32</th> <th>-33</th> <th>3 53.0</th> <th>-1 53 21</th> <th>-0.1719</th> <th>.5434</th> <th>+0.1000</th> <th>-9.6082</th> <th>.9610</th>	5	+32	-33	3 53.0	-1 53 21	-0.1719	.5434	+0.1000	-9.6082	.9610
	17	7 Pleiadum <th>8</th> <th>+53</th> <th>-14</th> <th>3 54.5</th> <th>-1 51 55</th> <th>+0.1894</th> <th>.5434</th> <th>+0.0999</th> <th>-9.6025</th> <th>.9621</th>	8	+53	-14	3 54.5	-1 51 55	+0.1894	.5434	+0.0999	-9.6025	.9621
	17	B.A.C. 1155 <th>7</th> <th>+90</th> <th>+45</th> <th>3 54.6</th> <th>-1 51 45</th> <th>+1.1631</th> <th>.5434</th> <th>+0.0999</th> <th>-9.5867</th> <th>.9650</th>	7	+90	+45	3 54.6	-1 51 45	+1.1631	.5434	+0.0999	-9.5867	.9650
	17	k Pleiadum <th>7½</th> <th>+21</th> <th>-45</th> <th>3 55.2</th> <th>-1 51 10</th> <th>-0.3714</th> <th>.5434</th> <th>+0.0999</th> <th>-9.6113</th> <th>.9603</th>	7½	+21	-45	3 55.2	-1 51 10	-0.3714	.5434	+0.0999	-9.6113	.9603
	17	l Pleiadum <th>7½</th> <th>+23</th> <th>-43</th> <th>3 58.9</th> <th>-1 47 38</th> <th>-0.3369</th> <th>.5434</th> <th>+0.0998</th> <th>-9.6108</th> <th>.9604</th>	7½	+23	-43	3 58.9	-1 47 38	-0.3369	.5434	+0.0998	-9.6108	.9604
	17	8 Pleiadum <th>8½</th> <th>+44</th> <th>-22</th> <th>4 4.3</th> <th>-1 42 22</th> <th>+0.0343</th> <th>.5435</th> <th>+0.0997</th> <th>-9.6051</th> <th>.9616</th>	8½	+44	-22	4 4.3	-1 42 22	+0.0343	.5435	+0.0997	-9.6051	.9616
	17	9 Pleiadum <th>8½</th> <th>+44</th> <th>-22</th> <th>4 5.4</th> <th>-1 41 21</th> <th>+0.0418</th> <th>.5435</th> <th>+0.0997</th> <th>-9.6050</th> <th>.9616</th>	8½	+44	-22	4 5.4	-1 41 21	+0.0418	.5435	+0.0997	-9.6050	.9616
	17	d Pleiadum <th>5</th> <th>+61</th> <th>-8</th> <th>4 7.4</th> <th>-1 39 27</th> <th>+0.3081</th> <th>.5435</th> <th>+0.0996</th> <th>-9.6010</th> <th>.9623</th>	5	+61	-8	4 7.4	-1 39 27	+0.3081	.5435	+0.0996	-9.6010	.9623
	17	10 Pleiadum <th>8</th> <th>+41</th> <th>-25</th> <th>4 10.4</th> <th>-1 36 28</th> <th>+0.0214</th> <th>.5436</th> <th>+0.0995</th> <th>-9.6063</th> <th>.9613</th>	8	+41	-25	4 10.4	-1 36 28	+0.0214	.5436	+0.0995	-9.6063	.9613
	17	11 Pleiadum <th>8½</th> <th>+51</th> <th>-16</th> <th>4 16.2</th> <th>-1 30 55</th> <th>+0.1530</th> <th>.5437</th> <th>+0.0994</th> <th>-9.6037</th> <th>.9618</th>	8½	+51	-16	4 16.2	-1 30 55	+0.1530	.5437	+0.0994	-9.6037	.9618
	17	12 Pleiadum <th>7½</th> <th>+26</th> <th>-40</th> <th>4 24.7</th> <th>-1 22 39</th> <th>-0.2885</th> <th>.5437</th> <th>+0.0988</th> <th>-9.6107</th> <th>.9604</th>	7½	+26	-40	4 24.7	-1 22 39	-0.2885	.5437	+0.0988	-9.6107	.9604
	17	13 Pleiadum <th>8</th> <th>+60</th> <th>-9</th> <th>4 27.7</th> <th>-1 19 50</th> <th>+0.2885</th> <th>.5437</th> <th>+0.0986</th> <th>-9.6018</th> <th>.9622</th>	8	+60	-9	4 27.7	-1 19 50	+0.2885	.5437	+0.0986	-9.6018	.9622
	17	14 Pleiadum <th>9</th> <th>+79</th> <th>+4</th> <th>4 30.4</th> <th>-1 17 10</th> <th>+0.5430</th> <th>.5437</th> <th>+0.0985</th> <th>-9.5978</th> <th>.9629</th>	9	+79	+4	4 30.4	-1 17 10	+0.5430	.5437	+0.0985	-9.5978	.9629
	17	15 Pleiadum <th>8½</th> <th>+51</th> <th>-16</th> <th>4 33.2</th> <th>-1 14 32</th> <th>+0.1521</th> <th>.5437</th> <th>+0.0985</th> <th>-9.6041</th> <th>.9617</th>	8½	+51	-16	4 33.2	-1 14 32	+0.1521	.5437	+0.0985	-9.6041	.9617
	17	16 Pleiadum <th>9½</th> <th>+75</th> <th>+2</th> <th>4 33.7</th> <th>-1 13 59</th> <th>+0.4917</th> <th>.5437</th> <th>+0.0985</th> <th>-9.5987</th> <th>.9628</th>	9½	+75	+2	4 33.7	-1 13 59	+0.4917	.5437	+0.0985	-9.5987	.9628
	17	17 Pleiadum <th>8</th> <th>+84</th> <th>+7</th> <th>4 34.3</th> <th>-1 13 25</th> <th>+0.5926</th> <th>.5438</th> <th>+0.0984</th> <th>-9.5971</th> <th>.9631</th>	8	+84	+7	4 34.3	-1 13 25	+0.5926	.5438	+0.0984	-9.5971	.9631
	17	18 Pleiadum <th>8</th> <th>+50</th> <th>-17</th> <th>4 34.4</th> <th>-1 13 17</th> <th>+0.1421</th> <th>.5438</th> <th>+0.0984</th> <th>-9.6044</th> <th>.9617</th>	8	+50	-17	4 34.4	-1 13 17	+0.1421	.5438	+0.0984	-9.6044	.9617
	17	p Pleiadum <th>7½</th> <th>+52</th> <th>-15</th> <th>4 35.2</th> <th>-1 12 36</th> <th>+0.1684</th> <th>.5438</th> <th>+0.0984</th> <th>-9.6039</th> <th>.9618</th>	7½	+52	-15	4 35.2	-1 12 36	+0.1684	.5438	+0.0984	-9.6039	.9618
	17	19 Pleiadum <th>8</th> <th>+76</th> <th>+3</th> <th>4 35.6</th> <th>-1 12 8</th> <th>+0.5101</th> <th>.5438</th> <th>+0.0984</th> <th>-9.5985</th> <th>.9628</th>	8	+76	+3	4 35.6	-1 12 8	+0.5101	.5438	+0.0984	-9.5985	.9628
	17	20 Pleiadum <th>8</th> <th>+22</th> <th>-43</th> <th>4 35.9</th> <th>-1 11 52</th> <th>-0.3458</th> <th>.5438</th> <th>+0.0983</th> <th>-9.6119</th> <th>9.9602</th>	8	+22	-43	4 35.9	-1 11 52	-0.3458	.5438	+0.0983	-9.6119	9.9602

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D
Feb. 17	22 Pleiadum	8	+67	-4	4 37.0	-1 10 50	+0.3309	0.5439	+0.983	+9.6004	9.9685
17	21 Pleiadum	8 $\frac{1}{2}$	+18	-47	4 37.0	-1 10 46	-0.4187	0.5439	+0.983	+9.6131	.9600
17	23 Pleiadum	8 $\frac{1}{2}$	+90	+10	4 38.5	-1 9 22	+0.6507	0.5439	+0.983	+9.5963	.9632
17	24 Pleiadum	8	+41	-25	4 38.8	-1 9 3	-0.0141	0.5439	+0.982	+9.6069	.9612
17	γ Tauri	3 $\frac{1}{2}$	+53	-14	4 38.9	-1 8 59	+0.1856	0.5439	+0.982	+9.6037	.9618
17	25 Pleiadum	8 $\frac{1}{2}$	+90	+15	4 43.0	-1 4 58	+0.7325	0.5439	+0.982	+9.5949	.9635
17	26 Pleiadum	9	+90	+19	4 45.8	-1 2 17	+0.8097	0.5439	+0.982	+9.5938	.9637
17	27 Pleiadum	8 $\frac{1}{2}$	+42	-24	4 58.9	-0 49 38	+0.0022	0.5441	+0.977	+9.6071	.9612
17	28 Pleiadum	7	+90	+30	5 3.5	-0 45 9	+0.9692	0.5441	+0.976	+9.5917	.9641
17	29 Pleiadum	8	+40	-26	5 6.4	-0 42 22	-0.0343	0.5442	+0.975	+9.6079	.9610
17	s Pleiadum	7 $\frac{1}{2}$	+63	-6	5 19.2	-0 29 59	+0.3349	0.5443	+0.970	+9.6024	.9621
17	f Pleiadum	4 $\frac{1}{2}$	+61	-8	5 24.9	-0 24 29	+0.3115	0.5444	+0.968	+9.6028	.9620
17	h Pleiadum	5 $\frac{1}{2}$	+55	-12	5 25.5	-0 23 58	+0.2209	0.5444	+0.968	+9.6043	.9617
17	30 Pleiadum	8 $\frac{1}{2}$	+61	-8	5 26.1	-0 23 22	+0.3137	0.5444	+0.968	+9.6029	.9620
17	31 Pleiadum	8	+39	-27	5 27.7	-0 21 52	-0.0577	0.5444	+0.967	+9.6067	.9608
17	32 Pleiadum	8	+40	-26	5 29.9	-0 19 38	-0.0378	0.5445	+0.966	+9.6085	.9609
17	33 Pleiadum	8 $\frac{1}{2}$	+48	-18	5 32.1	-0 17 36	+0.1108	0.5445	+0.966	+9.6063	.9613
17	34 Pleiadum	7 $\frac{1}{2}$	+90	+14	5 40.8	-0 9 6	+0.7081	0.5446	+0.963	+9.5970	.9631
17	35 Pleiadum	9	+50	-17	5 41.3	-0 8 41	+0.1289	0.5446	+0.963	+9.6062	.9613
17	36 Pleiadum	9	+52	-15	5 46.3	-0 4 49	+0.1643	0.5447	+0.961	+9.6057	.9615
17	37 Pleiadum	8	+43	-23	5 45.9	-0 4 14	+0.0212	0.5447	+0.961	+9.6080	.9610
17	39 Pleiadum	8	+35	-30	6 0.0	-0 9 23	-0.1169	0.5448	+0.956	+9.6105	.9605
17	40 Pleiadum	7 $\frac{1}{2}$	+74	+2	6 11.9	-0 20 52	+0.4850	0.5448	+0.953	+9.6014	.9623
17	36 Tauri	6 $\frac{1}{2}$	+90	+22	12 18.4	+6 14 57	+0.8231	0.5484	+0.825	+9.6046	.9617
17	χ Tauri	5 $\frac{1}{2}$	+25	-37	20 23.1	-9 57 6	-0.2959	0.5535	+0.625	+9.6308	.9562
18	k Tauri	6	+90	+34	11 54.9	+5 1 44	+0.9215	0.5611	+0.277	+9.6232	.9579
19	132 Tauri	5 $\frac{1}{2}$	+90	+62	9 31.2	+1 50 46	+1.2581	0.5697	-0.271	+9.6180	.9590
19	139 Tauri	5 $\frac{1}{2}$	+21	-38	13 14.6	+5 25 50	-0.3613	0.5702	-0.362	+9.6408	.9539
20	s Geminor.	3 $\frac{1}{2}$	-6	-65	8 23.6	-0 8 2	-0.8247	0.5731	-0.681	+9.6303	.9563
20	B.A.C. 2238	6	+71	0	11 47.4	+3 8 10	+0.4362	0.5731	-0.947	+9.6052	.9616
20	44 Geminor.	6 $\frac{1}{2}$	+90	+20	17 20.1	+8 28 24	+0.8277	0.5731	-1.082	+9.5890	.9646
20	δ Geminor.	3 $\frac{1}{2}$	+90	+13	23 30.9	-9 34 36	+0.7353	0.5727	-1.241	+9.5779	.9664
21	63 Geminor.	5 $\frac{1}{2}$	+90	+19	2 42.2	-6 30 27	+0.8515	0.5725	-1.317	+9.5683	.9680
21	85 Geminor.	6 $\frac{1}{2}$	+90	+6	14 25.0	+4 46 11	+0.6642	0.5709	-1.588	+9.5390	.9723
21	B.A.C. 2683	6	+90	+31	18 15.8	+8 23 24	+1.0736	0.5701	-1.669	+9.5176	.9751
22	54 Cancri.	6 $\frac{1}{2}$	+90	+1	13 58.7	+3 27 58	+0.7879	0.5658	-2.062	+9.4366	.9832
22	α^1 Cancri	6	+56	-22	16 38.1	+6 1 38	+0.2425	0.5652	-2.111	+9.4364	.9832
22	α^2 Cancri	6	+39	-37	16 46.5	+6 9 44	-0.0484	0.5648	-3.111	+9.4432	.9826
23	ξ Leonis	6	+90	+7	7 42.5	-3 27 30	+0.8310	0.5614	-2.342	+9.3146	.9906
23	σ Leonis	3 $\frac{1}{2}$	+90	+38	11 44.6	+0 27 8	+1.2610	0.5603	-2.394	+9.2614	.9926
23	B.A.C. 3398	6	+76	-10	18 26.2	+6 54 23	+0.5603	0.5598	-2.477	+9.2215	.9939
23	B.A.C. 3047	6	+90	+15	19 10.8	+7 37 25	+0.9661	0.5591	-2.480	+9.1929	.9947
23	π Leonis	5	+90	+17	20 6.2	+8 30 50	+1.0205	0.5590	-2.491	+9.1799	.9950
24	34 Sextantis	6	+76	-12	14 51.7	+2 36 52	+0.5518	0.5563	-2.636	+8.8753	.9968
24	36 Sextantis	6	+90	+42	15 59.7	+3 42 29	+1.3295	0.5563	-2.643	+8.7485	.9993
25	p^5 Leonis	5	+68	-19	4 41.3	-8 2 30	+0.4398	0.5562	-2.683	+8.0754	0.0000
25	e Leonis	5	+88	+44	12 1.5	-0 57 37	+1.3487	0.5562	-2.684	-8.5923	9.9997
25	B.A.C. 4006	6	+86	+26	21 11.1	+7 52 43	+1.1811	0.5568	-2.666	-8.9004	.9986
26	q Virginis	6	+60	-24	15 53.8	+1 55 49	+0.3472	0.5605	-2.552	-9.1791	.9950
27	69 Virginis	5 $\frac{1}{2}$	+75	+39	13 51.8	-0 55 59	+1.2729	0.5674	-2.277	-9.4202	.9844
Mar. 1	42 Libræ	5 $\frac{1}{2}$	+20	-47	20 57.5	+4 6 47	-0.0916	0.5849	-1.131	-9.5964	.9628
2	λ Scorpii	5	+65	+13	2 12.9	+9 9 52	+0.9239	0.5848	-0.992	-9.6244	.9576
2	19 Scorpii	5 $\frac{1}{2}$	-42	-90	12 56.2	-4 32 8	-1.0892	0.5858	-0.705	-9.6065	.9613
2	σ Scorpii	3 $\frac{1}{2}$	+41	-21	13 7.3	-4 21 26	+0.3599	0.5858	-0.698	-9.6301	.9564
2	α Scorpii	1 $\frac{1}{2}$	+64	+23	16 21.2	-1 15 10	+1.0366	0.5863	-0.609	-9.6438	.9532

OCCULTATIONS, 1861.

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ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.						
			North-ern.	South-ern.		H	Y	p'	q'	Log $\sin D$	Log $\cos D$	
Mar.	2 22 Scorpii	5	+ 2	- 0	h m	h m s	-0.3340	0.5863	-0.0596	-9.6328	9.9580	
	3 A Ophiuchi	5	+59	-63	10 38.2	- 7 41 7	+0.6767	.5803	-0.0098	-9.6479	.9522	
	3 δ Ophiuchi	3 $\frac{1}{2}$	-36	-90	13 18.7	- 5 6 49	-0.9303	.5820	-0.0029	-9.6236	.9578	
	3 B.A.C. 5909	6 $\frac{1}{2}$	+38	-27	17 11.2	- 1 23 17	+0.2591	.5808	+0.0078	-9.6443	.9530	
	4 λ Sagittarii	3	+59	-5	16 15.9	- 3 11 5	+0.6345	.5706	+0.0681	-9.6339	.9555	
	5 ν Sagittarii	5	-47	-90	3 26.5	+ 7 34 59	-1.1795	.5637	+0.0951	-9.5803	.9643	
	5 ν Sagittarii	5	-52	-90	3 50.7	+ 6 58 18	-1.2170	.5635	+0.0959	-9.5890	.9646	
	6 σ Capricor.	5 $\frac{1}{2}$	+54	-19	17 54.5	- 3 16 17	+0.3981	.5378	+0.1702	-9.5246	.9742	
	6 π Capricor.	5	+37	-36	21 42.1	+ 0 23 57	+0.1000	.5352	+0.1758	-9.5052	.9765	
	6 ϵ Capricor.	5	+22	-53	22 27.0	+ 1 7 21	-0.1929	.5346	+0.1767	-9.4963	.9775	
	7 ν Capricor.	5 $\frac{1}{2}$	+72	+29	3 50.6	+ 6 20 38	+1.1641	.5309	+0.1843	-9.5043	.9767	
	8 λ Capricor.	5 $\frac{1}{2}$	+78	+ 6	13 35.7	- 8 55 38	+0.8734	.5119	+0.2206	-9.3181	.9904	
	9 δ Aquarii	4 $\frac{1}{2}$	+81	- 6	5 45.1	+ 6 46 2	+0.6642	.5053	+0.2310	-9.1684	.9952	
	9 ϵ Aquarii	5 $\frac{1}{2}$	+82	+23	7 34.5	+ 8 32 23	+1.1347	.5046	+0.2318	-9.1705	.9952	
	9 π Aquarii	5	+12	-76	17 9.9	- 6 8 22	-0.5496	.5018	+0.2357	-8.9353	.9984	
	12 d Piscium	5 $\frac{1}{2}$	+ 4	-82	2 11.0	+ 1 19 15	-0.7194	.4983	+0.2304	+9.1111	.9964	
	13 η Piscium	4	+20	-59	16 30.3	- 9 25 48	-0.4066	.5088	+0.2006	+9.4024	.9857	
	14 δ Arietis	5 $\frac{1}{2}$	-21	-71	16 32.2	-10 6 18	-1.0597	.5194	+0.1705	+9.5183	.9750	
	15 μ Arietis	5 $\frac{1}{2}$	+90	+ 8	4 37.9	+ 1 37 13	+0.7269	.5254	+0.1519	+9.5217	.9746	
	15 47 Arietis	6	+90	+33	12 17.6	+ 9 2 34	+1.0879	.5290	+0.1409	+9.5363	.9727	
	15 ϵ Arietis	4 $\frac{1}{2}$	+68	- 7	12 50.7	+ 9 34 38	+0.4189	.5297	+0.1397	+9.5500	.9708	
	16 9 Tauri	6 $\frac{1}{2}$	+72	- 1	6 47.2	+ 2 56 34	+0.4671	.5390	+0.1069	+9.5874	.9648	
	16 g Pleiadum	5 $\frac{1}{2}$	+21	-45	10 24.7	+ 6 26 56	-0.3697	.5412	+0.0996	+9.6068	.9612	
	16 b Pleiadum	4 $\frac{1}{2}$	+32	-33	10 27.0	+ 6 29 10	-0.1729	.5412	+0.0995	+9.6038	.9618	
	16 m Pleiadum	7	-16	-66	10 33.8	+ 6 35 45	-0.9596	.5412	+0.0993	+9.6161	.9594	
	16 e Pleiadum	5	+11	-56	10 35.5	+ 6 37 23	-0.5488	.5412	+0.0993	+9.6098	.9606	
	16 1 Pleiadum	8	+38	-28	10 42.8	+ 6 24 23	-0.0622	.5412	+0.0991	+9.6024	.9621	
	16 2 Pleiadum	8 $\frac{1}{2}$	+12	-55	10 45.9	+ 6 47 22	-0.5282	.5412	+0.0990	+9.6098	.9606	
	16 3 Pleiadum	9	+35	-30	10 47.0	+ 6 48 26	-0.1084	.5412	+0.0990	+9.6033	.9619	
	16 4 Pleiadum	8	+20	-45	10 47.7	+ 6 49 10	-0.3849	.5412	+0.0990	+9.6076	.9611	
	16 5 Pleiadum	9	- 1	-65	10 48.4	+ 6 49 47	-0.7381	.5412	+0.0990	+9.6125	.9601	
	16 6 Pleiadum	9	+23	-43	10 49.4	+ 6 50 50	-0.3367	.5412	+0.0989	+9.6069	.9612	
	16 c Pleiadum	5	+18	-47	10 53.1	+ 6 54 21	-0.4121	.5412	+0.0988	+9.6082	.9610	
	16 7 Pleiadum	8	+39	-27	10 54.6	+ 6 55 47	-0.0482	.5412	+0.0988	+9.6025	.9621	
	16 B.A.C. 1155	7	+90	+27	10 54.7	+ 6 55 58	+0.9331	.5412	+0.0988	+9.5866	.9650	
	16 k Pleiadum	7 $\frac{1}{2}$	+ 7	-60	10 55.1	+ 6 56 18	-0.6137	.5412	+0.0988	+9.6113	.9603	
	16 l Pleiadum	7 $\frac{1}{2}$	+ 9	-58	10 59.1	+ 7 0 8	-0.5784	.5412	+0.0986	+9.6107	.9604	
	16 8 Pleiadum	8 $\frac{1}{2}$	+30	-35	11 4.6	+ 7 5 30	-0.2043	.5413	+0.0984	+9.6064	.9616	
	16 9 Pleiadum	8 $\frac{1}{2}$	+31	-35	11 5.6	+ 7 6 30	-0.1968	.5413	+0.0984	+9.6051	.9616	
	16 d Pleiadum	5	+46	-20	11 7.7	+ 7 8 28	+0.0714	.5413	+0.0983	+9.6010	.9623	
	16 10 Pleiadum	8	+27	-38	11 10.8	+ 7 11 27	-0.2608	.5413	+0.0981	+9.6063	.9613	
	16 11 Pleiadum	8 $\frac{1}{2}$	+37	-28	11 16.6	+ 7 17 5	-0.0848	.5413	+0.0979	+9.6037	.9618	
	16 12 Pleiadum	7 $\frac{1}{2}$	+12	-54	11 25.3	+ 7 25 29	-0.5299	.5414	+0.0976	+9.6108	.9604	
	16 13 Pleiadum	8 $\frac{1}{2}$	+45	-21	11 28.3	+ 7 28 23	+0.0515	.5414	+0.0975	+9.6017	.9622	
	16 14 Pleiadum	9	+61	- 8	11 31.0	+ 7 31 2	+0.3075	.5415	+0.0974	+9.5978	.9629	
	16 15 Pleiadum	8 $\frac{1}{2}$	+37	-29	11 33.8	+ 7 33 44	-0.0901	.5415	+0.0974	+9.6041	.9618	
	16 16 Pleiadum	9 $\frac{1}{2}$	+57	-11	11 34.4	+ 7 34 17	+0.2562	.5415	+0.0974	+9.5987	.9628	
	16 17 Pleiadum	8	+64	- 5	11 35.0	+ 7 34 51	+0.3577	.5415	+0.0973	+9.5971	.9631	
	16 18 Pleiadum	8	+36	-29	11 35.1	+ 7 34 59	-0.0961	.5415	+0.0973	+9.6043	.9617	
	16 p Pleiadum	7 $\frac{1}{2}$	+38	-28	11 35.9	+ 7 35 47	-0.0697	.5415	+0.0973	+9.6039	.9618	
	16 19 Pleiadum	8	+59	-10	11 36.3	+ 7 36 8	+0.2747	.5415	+0.0973	+9.5985	.9628	
	16 20 Pleiadum	8	+11	-55	11 36.6	+ 7 36 26	-0.5389	.5415	+0.0973	+9.6120	.9602	
	16 22 Pleiadum	8	+51	-16	11 37.7	+ 7 37 30	+0.1545	.5415	+0.0973	+9.6004	.9625	
	16 21 Pleiadum	8 $\frac{1}{2}$	+ 1	-63	11 37.8	+ 7 37 33	-0.6613	.5415	+0.0972	+9.6131	.9600	
	16 23 Pleiadum	8 $\frac{1}{2}$	+69	- 2	11 39.2	+ 7 38 56	+0.4165	.5415	+0.0972	+9.5963	.9632	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Mar. 16	24 Pleiadum	8	+27	-38	11 39.5	+ 7 39 14	-0.2536	0.5415	+0.0972	+9.6069	9.9612
16	7 Tauri	3½	+39	-27	11 39.6	+ 7 39 21	-0.0547	0.5415	+0.0972	+9.6037	9.9618
16	25 Pleiadum	8½	+75	+ 2	11 43.9	+ 7 43 29	+0.4991	0.5415	+0.0971	+9.5950	9.9635
16	26 Pleiadum	9	+83	+ 6	11 46.6	+ 7 46 8	+0.5765	0.5415	+0.0970	+9.5938	9.9637
16	27 Pleiadum	8½	+28	-37	11 59.9	+ 7 59 0	-0.2372	0.5416	+0.0966	+9.6071	9.9612
16	28 Pleiadum	7	+90	+15	12 4.6	+ 8 3 32	+0.7370	0.5416	+0.0964	+9.5917	9.9641
16	29 Pleiadum	8	+26	-39	12 7.5	+ 8 6 21	-0.2739	0.5416	+0.0963	+9.6079	9.9610
16	s Pleiadum	7½	+47	-19	12 20.6	+ 8 18 56	+0.0979	0.5417	+0.0969	+9.6024	9.9621
16	f Pleiadum	4½	+46	-20	12 26.3	+ 8 24 32	+0.0744	0.5417	+0.0957	+9.6029	9.9620
16	λ Pleiadum	5½	+41	-24	12 26.9	+ 8 25 5	-0.0155	0.5417	+0.0957	+9.6043	9.9617
16	30 Pleiadum	8½	+46	-20	12 27.7	+ 8 26 51	+0.0764	0.5417	+0.0957	+9.6028	9.9620
16	31 Pleiadum	8	+25	-40	12 29.1	+ 8 27 12	-0.2978	0.5417	+0.0957	+9.6087	9.9608
16	32 Pleiadum	8½	+24	-39	12 31.4	+ 8 29 27	-0.2776	0.5417	+0.0956	+9.6085	9.9609
16	34 Pleiadum	7½	+73	+ 1	12 42.5	+ 8 40 8	+0.4740	0.5418	+0.0952	+9.5969	9.9631
16	35 Pleiadum	9	+35	-30	12 42.9	+ 8 40 32	-0.1097	0.5418	+0.0952	+9.6062	9.9613
16	36 Pleiadum	9	+37	-28	12 47.0	+ 8 44 29	-0.0741	0.5419	+0.0951	+9.6057	9.9615
16	37 Pleiadum	8	+29	-36	12 47.6	+ 8 45 4	-0.2186	0.5419	+0.0951	+9.6080	9.9610
16	39 Pleiadum	8	+22	-43	13 1.9	+ 8 58 52	-0.3578	0.5420	+0.0945	+9.6104	9.9605
16	40 Pleiadum	7½	+57	-11	13 13.9	+ 9 10 31	+0.2490	0.5421	+0.0941	+9.6013	9.9623
17	χ Tauri	5½	+11	-52	3 39.4	- 0 53 10	-0.5429	0.5491	+0.0633	+9.6308	9.9562
18	132 Tauri	5½	+90	+42	17 40.7	+11 48 1	+1.0457	0.5685	-0.0266	+9.6180	9.9590
18	139 Tauri	5½	+7	-55	21 30.4	- 8 30 29	-0.6046	0.5622	-0.0350	+9.6408	9.9539
19	ε Geminor.	3½	-25	-65	17 14.2	+10 30 30	-1.0649	0.5640	-0.0837	+9.6303	9.9563
20	δ Geminor.	3½	+78	+ 2	8 50.1	+ 1 32 32	+0.5292	0.5635	-0.1209	+9.5779	9.9654
20	63 Geminor.	5½	+90	+ 8	12 7.4	+ 4 42 42	+0.6496	0.5632	-0.1280	+9.5683	9.9620
21	d¹ Cancri	6	+40	-33	12 15.1	+ 3 58 26	-0.0877	0.5602	-0.1793	+9.5076	9.9763
21	d² Cancri	6	+90	+29	13 21.7	+ 5 2 39	+1.0807	0.5602	-0.1818	+9.4781	9.9794
22	ξ Leonis	6	+90	+ 2	18 30.5	+ 9 9 45	+0.7076	0.5560	-0.2290	+9.3146	9.9906
22	ο Leonis	3½	+90	+28	22 36.7	-10 52 37	+1.1495	0.5556	-0.2353	+9.2613	9.9926
23	π Leonis	5	+90	+11	7 5.3	- 2 43 45	+0.9241	0.5552	-0.2449	+9.1797	9.9950
23	B.A.C. 3529	6	+54	-28	16 8.5	+ 6 2 31	+0.2373	0.5551	-0.2535	+9.0935	9.9966
24	p³ Leonis	5	+66	-20	15 48.1	+ 4 52 36	+0.4205	0.5572	-0.2653	+8.0751	0.0000
24	ε Leonis	5	+88	+45	23 5.5	+11 54 41	+1.3459	0.5503	-0.2671	-8.5923	9.9997
29	42 Libræ	5½	+31	-34	5 11.9	- 9 50 59	+0.1286	0.5962	-0.1144	-9.5984	9.9628
29	A Scorpii	5	+65	+31	10 16.2	- 4 59 6	+1.1314	0.5961	-0.1002	-9.6244	9.9576
29	B.A.C. 5253	6	+41	-23	10 23.7	- 4 51 52	+0.3247	0.5956	-0.0993	-9.6113	9.9603
29	B.A.C. 5255	6	+65	+38	10 29.7	- 4 46 10	+1.1959	0.5966	-0.0992	-9.6258	9.9573
29	3 Scorpii	6	+65	+20	10 40.3	- 4 36 0	+1.0132	0.5966	-0.0988	-9.6231	9.9579
29	B.A.C. 5286	6½	+50	-15	12 10.8	- 3 9 9	+0.4730	0.5965	-0.0948	-9.6165	9.9593
29	19 Scorpii	5½	-24	-90	20 37.6	+ 4 56 59	-0.8339	0.5958	-0.0703	-9.6065	9.9613
29	σ Scorpii	3½	+58	- 8	20 48.4	+ 5 7 20	+0.5876	0.5957	-0.0698	-9.6301	9.9564
29	α Scorpii	1½	+64	+51	23 55.9	+ 8 7 13	+1.2569	0.5962	-0.0610	-9.6437	9.9532
30	22 Scorpii	5	+15	-47	0 16.1	+ 8 26 36	-0.0905	0.5961	-0.0603	-9.6227	9.9580
30	A Ophiuchi	5	+64	+14	17 39.2	+ 1 7 33	+0.9206	0.5920	-0.0086	-9.6478	9.9522
30	38 Ophiuchi	6½	+64	+19	18 31.1	+ 1 57 19	+0.9922	0.5915	-0.0069	-9.6490	9.9519
30	δ Ophiuchi	3½	-21	-90	20 15.3	+ 3 37 21	-0.6651	0.5911	-0.0025	-9.6236	9.9578
31	9 Sagittarii	6½	+30	-32	19 57.0	+ 2 23 30	+0.1758	0.5780	+0.0621	-9.6254	9.9574
31	λ Sagittarii	3	+65	+11	22 34.5	+ 4 55 0	+0.8868	0.5759	+0.0701	-9.6330	9.9555
Apr. 1	ν¹ Sagittarii	5	-26	-90	9 32.9	- 8 31 12	-0.9072	0.5678	+0.0954	-9.5903	9.9643
1	ν² Sagittarii	5	-28	-90	9 56.7	- 8 8 17	-0.9232	0.5678	+0.0944	-9.5890	9.9646
2	f Sagittarii	5	-40	-90	8 23.9	-10 28 55	-1.1588	0.5499	+0.1442	-9.5359	9.9728
2	σ Capricor.	5½	+66	- 8	23 38.5	+ 4 15 6	+0.6040	0.5379	+0.1637	-9.5245	9.9742
3	π Capricor.	5	+51	-23	3 25.3	+ 7 54 32	+0.3398	0.5356	+0.1740	-9.5060	9.9766
3	ρ Capricor.	5	+35	-39	4 10.0	+ 8 37 49	+0.0474	0.5346	+0.1752	-9.4962	9.9775
4	ι Capricor.	5½	+78	+ 9	19 21.3	- 1 22 38	+1.0617	0.5101	+0.2178	-9.3181	9.9904

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Apr. 5	♈ Aquarii	4½	+82	+2	11 35.1	-9 36 38	+0.5306	0.5017	+2272	-9.1684	9.9962
5	♈ Aquarii	5½	+82	+38	13 25.0	-7 49 48	+1.2888	.5025	+2289	-9.1705	.9952
5	♈ Aquarii	5	+19	-66	23 3.2	+1 32 19	-0.4163	.4998	+2326	-8.9351	9.9984
7	♈ Piscium	4½	+41	-42	2 21.9	+4 6 18	+0.0029	.4961	+2360	+7.9373	0.0000
10	♈ Arietis	5½	-35	-71	23 29.8	-2 21 15	-1.2081	.5220	+1698	+9.5181	9.9750
11	B.A.C. 782	6½	+90	+38	6 14.9	+5 9 38	+1.1673	.5258	+1586	+9.4962	.9775
11	♈ Arietis	5½	+79	-1	10 33.5	+9 20 19	+0.5572	.5279	+1511	+9.5217	.9746
11	♈ Arietis	4½	+55	-16	18 45.5	-6 43 7	+0.2353	.5320	+1384	+9.5500	.9708
12	♈ Arietis	6½	+59	-11	8 41.6	+6 46 11	+0.2864	.5387	+1130	+9.5795	.9662
12	♈ Tauri	6	+57	-12	12 41.4	+10 38 10	+0.2541	.5407	+1055	+9.5874	.9648
12	♈ Pleiadum	5½	+8	-59	16 19.2	-9 51 10	-0.5899	.5422	+0.986	+9.6068	.9612
12	♈ Pleiadum	4½	+19	-46	16 21.6	-9 48 53	-0.3922	.5422	+0.985	+9.6037	.9618
12	♈ Pleiadum	7	-36	-66	16 22.4	-9 42 14	-1.1811	.5423	+0.982	+9.6161	.9594
12	♈ Pleiadum	5	-3	-66	16 30.2	-9 40 29	-0.7689	.5424	+0.982	+9.6098	.9607
12	♈ Pleiadum	8	+26	-39	16 37.4	-9 33 35	-0.2810	.5424	+0.979	+9.6023	.9621
12	♈ Pleiadum	8½	+2	-66	16 40.5	-9 30 35	-0.7487	.5425	+0.978	+9.6097	.9607
12	♈ Pleiadum	9	+23	-42	16 41.6	-9 29 32	-0.3273	.5425	+0.977	+9.6032	.9620
12	♈ Pleiadum	8	+7	-60	16 42.3	-9 28 52	-0.6052	.5425	+0.977	+9.6076	.9611
12	♈ Pleiadum	9	-13	-66	16 42.9	-9 28 14	-0.9260	.5425	+0.977	+9.6125	.9601
12	♈ Pleiadum	9	+11	-56	16 44.0	-9 27 13	-0.5569	.5425	+0.977	+9.6068	.9612
12	♈ Pleiadum	5	+6	-62	16 47.6	-9 23 39	-0.6327	.5425	+0.976	+9.6082	.9610
12	♈ Pleiadum	8	+26	-39	16 49.1	-9 22 15	-0.2677	.5425	+0.975	+9.6024	.9621
12	B.A.C. 1155	7	+90	+14	16 49.3	-9 22 3	+0.7164	.5425	+0.975	+9.5967	.9650
12	♈ Pleiadum	7½	-7	-66	16 49.7	-9 21 42	-0.8350	.5425	+0.975	+9.6113	.9603
12	♈ Pleiadum	7½	-5	-66	16 53.6	-9 17 51	-0.7992	.5426	+0.974	+9.6109	.9604
12	♈ Pleiadum	8½	+18	-48	16 59.2	-9 12 29	-0.4244	.5426	+0.972	+9.6051	.9616
12	♈ Pleiadum	8½	+18	-47	17 0.2	-9 11 28	-0.4170	.5426	+0.971	+9.6050	.9616
12	♈ Pleiadum	5	+33	-32	17 2.3	-9 9 32	-0.1480	.5426	+0.971	+9.6010	.9623
12	♈ Pleiadum	8	+14	-51	17 5.3	-9 6 32	-0.4811	.5426	+0.970	+9.6063	.9613
12	♈ Pleiadum	8½	+24	-41	17 11.2	-9 0 52	-0.3050	.5427	+0.968	+9.6036	.9618
12	♈ Pleiadum	7½	-2	-66	17 19.9	-8 52 30	-0.7516	.5427	+0.965	+9.6108	.9604
12	♈ Pleiadum	8½	+32	-33	17 22.9	-8 49 33	-0.1687	.5428	+0.964	+9.6018	.9622
12	♈ Pleiadum	9	+47	-19	17 25.7	-8 46 54	+0.0883	.5428	+0.963	+9.5978	.9629
12	♈ Pleiadum	8½	+24	-41	17 28.5	-8 44 10	-0.3066	.5428	+0.962	+9.6041	.9618
12	♈ Pleiadum	9½	+44	-22	17 29.0	-8 43 41	+0.0367	.5429	+0.960	+9.5987	.9628
12	♈ Pleiadum	8	+50	-17	17 29.6	-8 43 5	+0.1385	.5429	+0.960	+9.5971	.9631
12	♈ Pleiadum	8	+24	-41	17 29.7	-8 42 58	-0.3168	.5429	+0.960	+9.6043	.9617
12	♈ Pleiadum	7½	+25	-40	17 30.6	-8 42 9	-0.2903	.5429	+0.959	+9.6039	.9618
12	♈ Pleiadum	8	+45	-21	17 30.9	-8 41 47	+0.0552	.5429	+0.959	+9.5965	.9628
12	♈ Pleiadum	8	-5	-66	17 31.2	-8 41 31	-0.8098	.5429	+0.959	+9.6120	.9602
12	♈ Pleiadum	8	+38	-27	17 32.3	-8 40 26	-0.0654	.5429	+0.959	+9.6004	.9625
12	♈ Pleiadum	8	-10	-66	17 32.4	-8 40 24	-0.8837	.5429	+0.959	+9.6131	.9600
12	♈ Pleiadum	8½	+53	-14	17 33.9	-8 38 57	+0.1973	.5429	+0.959	+9.5962	.9632
12	♈ Pleiadum	8	+14	-51	17 34.2	-8 38 38	-0.4746	.5430	+0.958	+9.6069	.9612
12	♈ Tauri	3½	+26	-39	17 34.3	-8 38 34	-0.2729	.5430	+0.958	+9.6037	.9618
12	♈ Pleiadum	9	+59	-9	17 38.5	-8 34 30	+0.2798	.5431	+0.956	+9.5949	.9635
12	♈ Pleiadum	8½	+64	-5	17 41.3	-8 31 47	+0.3578	.5431	+0.956	+9.5938	.9637
12	♈ Pleiadum	8½	+16	-50	17 54.6	-8 18 54	-0.4589	.5431	+0.952	+9.6071	.9612
12	♈ Pleiadum	7	+77	+3	17 59.3	-8 14 21	+0.5186	.5432	+0.951	+9.5917	.9641
12	♈ Pleiadum	8	+14	-52	18 2.2	-8 11 31	-0.4961	.5432	+0.950	+9.6079	.9610
12	♈ Pleiadum	7½	+34	-30	18 15.3	-7 58 56	-0.1231	.5433	+0.946	+9.6024	.9621
12	♈ Pleiadum	4½	+33	-32	18 21.1	-7 53 20	-0.1470	.5433	+0.944	+9.6029	.9620
12	♈ Pleiadum	5½	+28	-37	18 21.6	-7 52 47	-0.2372	.5433	+0.944	+9.6044	.9617
12	♈ Pleiadum	8½	+33	-31	18 22.4	-7 51 59	-0.1450	.5434	+0.944	+9.6029	.9620
12	♈ Pleiadum	8	+12	-54	18 23.8	-7 50 39	-0.5200	.5434	+0.943	+9.6087	9.9608

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PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.**

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			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Apr. 12	32 Pleiadum	8	+13	-53	18 26.2	-7 48 24	-0.5003	.5434	+.0942	+9.6085	9.9889
	12 33 Pleiadum	8½	+22	-43	18 28.3	-7 46 19	-0.3499	.5434	+.0941	+0.6062	.9613
	12 34 Pleiadum	7½	+57	-10	18 37.2	-7 37 46	+0.2535	.5435	+.0938	+9.5969	.9631
	12 35 Pleiadum	9	+23	-42	18 37.7	-7 37 17	-0.3319	.5435	+.0938	+9.6062	.9613
	12 36 Pleiadum	9	+25	-40	18 41.8	-7 33 18	-0.2964	.5435	+.0937	+9.6057	.9615
	12 37 Pleiadum	8	+17	-49	18 42.4	-7 32 44	-0.4412	.5435	+.0937	+9.6080	.9610
	12 39 Pleiadum	8	+9	-58	18 56.2	-7 19 20	-0.5820	.5435	+.0933	+9.6104	.9605
	12 40 Pleiadum	7½	+43	-22	19 8.8	-7 7 11	+0.0269	.5437	+.0927	+9.6013	.9623
	13 γ Tauri	5½	-4	-65	9 37.4	+6 58 18	-0.7861	.5494	+0.066	+9.6308	.9662
	14 ϵ Tauri	5½	+70	+6	1 36.0	-1 42 1	-0.4330	.5543	+.0139	+9.6232	.9579
	15 132 Tauri	5½	+90	+24	0 3.0	-4 2 12	+0.7651	.5584	-.0267	+9.6180	.9590
	15 139 Tauri	5½	-11	-64	3 56.6	-0 16 48	-0.8884	.5584	-.0360	+9.6408	.9539
	15 5 Geminor.	6	+72	+5	9 55.0	+5 28 54	+0.4594	.5588	-.0509	+9.6169	.9592
	16 44 Geminor.	6½	+62	-7	9 32.0	+4 15 57	+0.3367	.5572	-.1050	+9.5890	.9646
	16 δ Geminor.	3½	+56	-13	16 5.0	+10 35 3	+0.2473	.5564	-.1190	+9.5779	.9664
16	63 Geminor.	5½	+65	-7	19 27.9	-10 9 7	+0.3696	.5558	-.1267	+9.5683	.9680
	17 85 Geminor.	6½	+53	-19	7 54.1	+1 51 3	+0.1937	.5537	-.1521	+9.5391	.9723
	17 B.A.C. 2683	6	+85	+2	11 59.3	+5 47 45	+0.6208	.5529	-.1601	+9.5177	.9751
	17 ζ Cancri	4½	+90	+54	15 20.9	+9 2 22	+1.2948	.5522	-.1663	+9.4914	.9781
	18 54 Cancri	6½	+64	-15	8 55.1	+2 0 25	+0.3716	.5490	-.1972	+9.4367	.9831
	19 α Leonis	3½	+90	+12	7 53.6	+0 12 14	+0.9265	.5463	-.2225	+9.9614	.9886
	19 B.A.C. 3398	6	+55	-27	14 54.6	+6 59 4	+0.2345	.5462	-.2375	+9.2215	.9939
	19 B.A.C. 3407	6	+88	-4	15 41.2	+7 44 7	+0.6732	.5462	-.2394	+9.1930	.9947
	19 π Leonis	5	+90	-2	16 39.1	+8 40 6	+0.7117	.5462	-.2393	+9.1800	.9950
	20 34 Sextantis	6	+60	-24	12 7.8	+2 29 23	+0.3174	.5475	-.2548	+8.8752	.9988
20	36 Sextantis	6	+90	+22	13 17.5	+4 36 42	+1.1122	.5479	-.2554	+8.7480	9.9993
	21 ρ Leonis	5	+57	-27	2 17.9	-6 49 24	+0.2739	.5504	-.2606	+8.0751	0.0000
	21 α Leonis	5	+88	+31	9 44.9	+0 22 17	+1.2269	.5530	-.2616	+8.5923	9.9987
	22 γ Virginis	6	+61	-22	13 35.5	+3 14 1	+0.3716	.5654	-.2519	-9.1792	.9950
	23 75 Virginis	6	+53	-25	14 13.4	+2 57 8	+0.3104	.5799	-.2940	-9.4032	.9856
	25 42 Libræ	5½	+39	-26	15 30.5	+2 15 42	+0.2751	.6047	-.1126	-9.5984	.9628
	25 B.A.C. 5197	6	+66	+15	17 33.7	+4 13 49	+0.9519	.6063	-.1074	-9.6140	.9598
	25 A Scorpii	5	+65	+55	20 27.3	+7 0 7	+1.2732	.6059	-.0891	-9.6945	.9576
26	19 Scorpii	5½	-14	-90	6 32.0	-7 20 32	-0.6445	.6067	-.0695	-9.6065	.9613
	26 α Scorpii	3½	+65	+3	6 42.5	-7 10 31	+0.7607	.6067	-.0691	-9.6301	.9564
26	22 Scorpii	5	+25	-36	10 4.3	-3 57 10	+0.0968	.6066	-.0593	-9.6228	.9580
	26 25 Scorpii	6	+32	-27	16 15.6	+1 58 36	+0.2562	.6058	-.0408	-9.6304	.9563
	27 A Ophiuchi	5	+64	+32	2 56.3	-11 47 26	+1.1223	.6027	-.0869	-9.6479	.9522
	27 39 Ophiuchi	5½	-54	-90	3 58.2	-10 48 7	-1.1611	.6025	-.0652	-9.6116	.9603
	27 δ Ophiuchi	3½	-8	-70	5 27.5	-9 22 31	+0.4359	.6016	-.0005	-9.6236	.9578
	27 δ Ophiuchi	5	-63	-90	7 7.6	-7 46 28	-1.2637	.6012	+.0099	-9.6100	.9606
	27 4 Sagittarii	5	-57	-90	19 56.2	+4 30 45	-1.2204	.5939	+.0410	-9.6059	.9614
	28 1 Sagittarii	3	+65	+31	6 57.9	-8 53 50	+1.1220	.5862	+.0708	-9.6339	.9555
28	26 Sagittarii	6	+22	-42	12 34.3	-3 30 26	-0.0084	.5817	+.0854	-9.6066	.9609
	28 γ Sagittarii	5	-10	-88	17 36.7	+1 20 22	-0.6222	.5773	+.0976	-9.5903	.9643
	28 γ Sagittarii	5	-12	-90	17 59.8	+1 42 46	-0.6642	.5772	+.0983	-9.5889	.9646
	28 α Sagittarii	4	-47	-90	21 58.3	+5 32 6	-1.1871	.5738	+.1075	-9.5724	.9674
	29 γ Sagittarii	5	-18	-90	15 50.6	-1 14 30	-0.8598	.5576	+.1449	-9.5359	.9728
	29 57 Sagittarii	5½	-45	-90	18 25.8	+1 15 15	-1.2106	.5550	+.1499	-9.5912	.9747
	30 α Capricor.	5½	+71	+11	6 44.2	-10 51 38	+0.9224	.5441	+.1704	-9.5246	.9742
	30 π Capricor.	5	+68	-7	10 26.3	-7 16 53	+0.6965	.5408	+.1760	-9.5051	.9766
May	30 ρ Capricor.	5	+51	-23	11 10.1	-6 34 32	+0.3873	.5404	+.1768	-9.4962	.9775
	1 18 Aquarii	6	+63	-17	14 15.1	-4 20 47	+0.4577	.5196	+.2023	-9.3672	.9679
	2 1 Capricor.	5½	+78	+47	1 46.0	+6 49 33	+1.3329	.5123	+.2178	-9.3189	.9804
	2 δ Aquarii	4½	+82	+20	17 51.9	-1 32 20	+1.0822	.5042	+.2168	-9.1683	9.9552

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallel.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
May	3 ♈ Aquarii	5	+32	-50	5 16.4	+ 9 32 59	-0.1650	.5001	+2311	-8.9352	9.9984
	4 ♈ Piscium	4½	+53	-31	8 31.2	-11 57 0	+0.2006	.4940	+2331	+7.9365	0.0000
	5 ♈ Piscium	5½	+11	-76	14 24.4	-6 52 31	-0.5803	.4978	+2255	+9.1111	9.9964
	5 45 Piscium	6	+81	-8	17 13.1	-4 8 28	+0.6032	.4986	+2242	+9.0812	.9968
	7 ♈ Piscium	4	+17	-61	4 39.2	+ 6 17 58	-0.4496	.5112	+1969	+9.4023	.9857
	10 ♈ Tauri	5½	-13	-65	15 20.9	- 9 36 49	-0.9103	.5522	+0609	+9.6308	.9562
	11 103 Tauri	6	+90	+48	11 49.1	+10 0 12	+1.1871	.5581	+0141	+9.6106	.9605
	12 132 Tauri	5½	+83	+14	5 37.8	+ 3 16 5	+0.5799	.5603	-0285	+9.6180	.9590
	12 MARS		+85	+14	6 32.8	+ 4 13 4	+0.5971	.5319	-0313	+9.6173	.9591
	12 139 Tauri	5½	-27	-64	9 31.4	+ 7 5 21	-1.0814	.5602	-0377	+9.6408	.9539
	13 B.A.C. 2236	6	+25	-39	9 18.7	+ 6 2 21	-0.2910	.5582	-0292	+9.6052	.9616
	13 ♈ Geminor.	3½	+42	-25	21 49.1	- 5 53 24	+0.0150	.5550	-1198	+9.5779	.9664
	14 63 Geminor.	5½	+49	-20	1 14.1	- 2 35 33	+0.1357	.5543	-1265	+9.5683	.9680
	14 ♈ Cancri	4½	+90	+29	21 23.1	- 7 8 0	+1.0563	.5463	-1661	+9.4913	.9781
	16 ♈ Leonis	6	+54	-21	10 30.1	+ 4 44 56	+0.2209	.5395	-2212	+9.3146	.9906
	16 ♈ Leonis	3½	+90	-2	14 52.0	+ 8 58 12	+0.6837	.5387	-2269	+9.2615	.9926
	16 ♈ Leonis	5	+70	-14	23 53.1	- 6 18 18	+0.4713	.5380	-2351	+9.1800	.9950
	17 16 Sextantis	6	+90	+51	4 10.9	- 2 8 52	+1.3605	.5379	-2387	+9.0765	.9969
	17 B.A.C. 3529	6	+30	-52	9 31.3	+ 3 1 4	-0.2114	.5379	-2431	+9.0935	9.9966
	18 ♈ Leonis	6	+90	+30	5 53.7	+ 1 16 27	+1.2109	.5399	-2534	+8.1125	0.0000
	18 ♈ Leonis	5	+45	-38	10 38.5	+ 3 18 58	+0.0639	.5416	-2549	+8.0753	0.0000
	18 ♈ Leonis	5	+88	+17	18 20.7	+10 45 52	+1.0447	.5434	-2556	-8.5923	9.9997
	23 42 Libræ	5½	+41	-24	2 12.3	- 9 14 20	+0.3026	.6054	-1091	-9.5953	.9629
	23 ♈ Scorpii	6	+65	+39	7 32.5	- 4 7 30	+1.2009	.6071	-0961	-9.6232	.9579
	23 B.A.C. 5286	6½	+64	-3	8 56.8	- 2 46 53	+0.6778	.6075	-0924	-9.6167	.9593
	23 19 Scorpii	5½	-10	-83	7 11.6	- 4 52 45	-0.5845	.6092	-0689	-8.6064	.9613
	23 ♈ Scorpii	3½	+65	+7	7 22.0	- 4 42 46	+0.8194	.6092	-0675	-9.6302	.9564
	23 22 Scorpii	5	+28	-32	20 42.6	+ 8 29 18	+0.1635	.6096	-0572	-9.6229	.9580
	24 ♈ Ophiuchi	5	+64	+44	13 24.2	+ 0 28 38	+1.2165	.6078	-0070	-9.6478	.9522
	24 39 Ophiuchi	5½	-45	-90	14 25.2	+ 1 27 8	-1.0629	.6074	-0029	-9.6116	.9603
	24 ♈ Ophiuchi	3½	-3	-62	15 53.2	- 2 51 26	-0.3288	.6071	+0009	-9.6236	.9578
	24 ♈ Ophiuchi	5	-52	-90	17 32.0	+ 4 26 3	-1.1384	.6066	+0066	-9.6101	.9606
	25 4 Sagittarii	5	-44	-90	6 7.8	- 7 29 32	-1.0804	.6009	+0430	-9.6059	.9614
	25 B.A.C. 6217	6½	+54	-9	14 26.9	+ 0 29 19	+0.5657	.5956	+0668	-9.6256	.9573
	25 1 Sagittarii	3	+65	+53	16 56.4	+ 2 52 46	+1.2653	.5958	+0732	-9.6338	.9555
	26 ♈ Sagittarii	5	0	-71	3 21.1	-11 7 9	-0.4594	.5861	+0098	-9.5903	.9643
	26 ♈ Sagittarii	5	-2	-74	3 43.7	-10 45 29	-0.4925	.5853	+1012	-9.5890	.9646
	26 ♈ Sagittarii	4	-32	-90	7 36.6	- 7 1 34	-1.0037	.5820	+1106	-9.5724	.9674
	26 B.A.C. 6607	6	+55	-13	14 8.1	- 0 44 59	+0.5018	.5772	+1254	-9.5857	.9651
	26 50 Sagittarii	6	+36	-31	16 30.6	+ 1 32 14	+0.1829	.5738	+1308	-9.5745	.9670
	27 ♈ Sagittarii	5	-6	-90	1 2.7	+ 9 45 30	-0.6554	.5659	+1479	-9.5359	.9728
	27 57 Sagittarii	5½	-27	-90	3 34.0	-11 48 40	-0.9991	.5633	+1529	-9.5212	.9747
	27 ♈ Capricor.	5½	+71	+27	15 33.8	- 0 14 11	+1.1215	.5521	+1736	-9.5245	.9743
	27 ♈ Capricor.	5	+72	+5	19 10.3	+ 3 14 58	+0.8328	.5489	+1787	-9.5051	.9766
	27 ♈ Capricor.	5	+64	-11	19 53.1	+ 3 56 17	+0.5479	.5483	+1801	-9.4962	.9775
	30 ♈ Aquarii	4½	+82	+42	1 23.9	+ 7 47 21	+1.3104	.5084	+2289	-9.1682	.9952
	30 ♈ Aquarii	5	+44	-37	12 37.6	- 5 18 11	+0.0716	.5036	+2323	-8.9350	9.9984
	31 B.A.C. 8152	6½	+90	+17	13 40.4	- 4 57 3	+1.0423	.4971	+2338	-7.9132	0.0000
	31 ♈ Piscium	4½	+66	-19	15 33.6	- 3 6 57	+0.4208	.4971	+2337	+7.9393	.0000
	31 9 Piscium	6	+81	-9	15 44.1	- 2 56 34	+0.6120	.4971	+2337	+7.8002	0.0000
June	1 ♈ Piscium	5½	+21	-62	21 15.8	+ 1 46 26	-0.3889	.4977	+2243	+9.1112	9.9964
	3 ♈ Piscium	4	+24	-53	11 25.6	- 9 8 4	-0.3143	.5103	+1950	+9.4023	.9857
	3 101 Piscium	6	+90	+12	13 31.0	- 7 6 38	+0.8758	.5116	+1928	+9.3823	.9870
	4 ♈ Arietis	5	-26	-71	11 17.1	- 9 58 59	-1.1138	.5234	+1667	+9.5183	.9750
	4 26 Arietis	6½	+37	-35	17 30.2	- 3 57 21	-0.0822	.5263	+1573	+9.5178	9.9751

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	Q'	Log sin D	Log cos D
June 4	μ Arietis	5 $\frac{1}{2}$	+83	+2	23 16.1	+ 1 37 48	+0.5998	.5276	+1.488	+9.5218	9.9746
	ϵ Arietis	4 $\frac{1}{2}$	+56	-15	7 23.9	+ 9 30 14	+0.2480	.5346	+1.346	+9.5500	.9708
	γ Pleiadum	5 $\frac{1}{2}$	+4	-63	4 44.2	+ 6 8 49	-0.6524	.5465	+0.956	+9.6068	.9612
	δ Pleiadum	4 $\frac{1}{2}$	+16	-50	4 46.4	+ 6 10 57	-0.4558	.5465	+0.955	+9.6037	.9618
6	m Pleiadum	7	-46	-66	4 53.3	+ 6 17 32	-1.2417	.5465	+0.953	+9.6161	.9594
6	e Pleiadum	5	-7	-66	4 55.2	+ 6 19 22	-0.8320	.5465	+0.952	+9.6098	.9607
6	1 Pleiadum	8	+22	-43	5 2.1	+ 6 26 5	-0.3467	.5465	+0.950	+9.6023	.9621
6	2 Pleiadum	8 $\frac{1}{2}$	-6	-66	5 5.2	+ 6 29 3	-0.8124	.5466	+0.949	+9.6098	.9607
6	3 Pleiadum	9	+19	-46	5 6.2	+ 6 30 3	-0.3935	.5466	+0.949	+9.6031	.9620
6	4 Pleiadum	8	+3	-64	5 6.9	+ 6 30 46	-0.6693	.5466	+0.948	+9.6076	.9611
6	5 Pleiadum	9	-18	-66	5 7.6	+ 6 31 23	-0.9888	.5466	+0.948	+9.6125	.9601
6	6 Pleiadum	9	+6	-61	5 8.7	+ 6 32 26	-0.6213	.5466	+0.948	+9.6069	.9612
6	c Pleiadum	5	+2	-65	5 12.3	+ 6 35 54	-0.6971	.5467	+0.946	+9.6081	.9610
6	7 Pleiadum	8	+22	-42	5 13.7	+ 6 37 18	-0.3338	.5467	+0.946	+9.6025	.9621
6	B.A.C. 1155	7	+90	+10	5 13.9	+ 6 37 28	+0.6459	.5467	+0.946	+9.5866	.9650
6	k Pleiadum	7 $\frac{1}{2}$	-12	-66	5 14.2	+ 6 37 49	-0.8989	.5467	+0.946	+9.6113	.9603
6	l Pleiadum	7 $\frac{1}{2}$	-9	-66	5 18.2	+ 6 41 37	-0.8638	.5468	+0.945	+9.6108	.9604
6	8 Pleiadum	8 $\frac{1}{2}$	+14	-52	5 23.6	+ 6 46 53	-0.4908	.5468	+0.943	+9.6051	.9616
6	9 Pleiadum	8 $\frac{1}{2}$	+14	-51	5 24.7	+ 6 47 56	-0.4835	.5468	+0.943	+9.6050	.9616
6	d Pleiadum	5	+29	-34	5 26.7	+ 6 49 50	-0.2158	.5468	+0.942	+9.6009	.9624
6	10 Pleiadum	8	+10	-56	5 29.8	+ 6 52 49	-0.5475	.5469	+0.941	+9.6062	.9613
6	11 Pleiadum	8 $\frac{1}{2}$	+20	-44	5 35.5	+ 6 58 25	-0.3724	.5470	+0.939	+9.6036	.9618
6	12 Pleiadum	7 $\frac{1}{2}$	-6	-66	5 44.1	+ 7 6 42	-0.8174	.5470	+0.936	+9.6107	.9604
6	13 Pleiadum	8 $\frac{1}{2}$	+28	-36	5 47.1	+ 7 9 36	-0.2370	.5470	+0.935	+9.6017	.9622
6	14 Pleiadum	9	+42	-23	5 49.8	+ 7 11 14	+0.0186	.5470	+0.934	+9.5978	.9629
6	15 Pleiadum	8 $\frac{1}{2}$	+20	-44	5 52.6	+ 7 14 52	-0.3750	.5470	+0.934	+9.6041	.9617
6	16 Pleiadum	9 $\frac{1}{2}$	+39	-25	5 53.1	+ 7 15 25	-0.0331	.5470	+0.933	+9.5987	.9628
6	17 Pleiadum	8	+45	-20	5 53.7	+ 7 15 59	+0.0683	.5470	+0.933	+9.5971	.9631
6	18 Pleiadum	8	+20	-45	5 53.9	+ 7 16 7	-0.3850	.5470	+0.933	+9.6043	.9617
6	p Pleiadum	7 $\frac{1}{2}$	+21	-44	5 54.7	+ 7 16 54	-0.3586	.5470	+0.933	+9.6039	.9618
6	19 Pleiadum	8	+40	-24	5 55.1	+ 7 17 17	-0.0148	.5470	+0.932	+9.5985	.9628
6	c Pleiadum	8	-10	-66	5 55.4	+ 7 17 34	-0.8762	.5470	+0.932	+9.6119	.9602
6	22 Pleiadum	8	+34	-31	5 56.4	+ 7 18 35	-0.1349	.5471	+0.932	+9.6004	.9624
6	21 Pleiadum	8 $\frac{1}{2}$	-15	-66	5 56.5	+ 7 18 38	-0.9497	.5471	+0.932	+9.6131	.9600
6	23 Pleiadum	8 $\frac{1}{2}$	+49	-17	5 57.9	+ 7 20 3	+0.1266	.5471	+0.931	+9.5863	.9632
6	24 Pleiadum	8	+11	-55	5 58.3	+ 7 20 21	-0.5421	.5471	+0.931	+9.6068	.9612
6	γ Tauri	3 $\frac{1}{2}$	+22	-42	5 58.4	+ 7 20 27	-0.3415	.5471	+0.931	+9.6037	.9618
6	25 Pleiadum	8 $\frac{1}{2}$	+54	-13	6 2.5	+ 7 24 28	+0.2082	.5471	+0.930	+9.5850	.9634
6	26 Pleiadum	9	+59	-9	6 5.3	+ 7 27 9	+0.2857	.5471	+0.929	+9.5938	.9637
6	27 Pleiadum	8 $\frac{1}{2}$	+11	-54	6 18.4	+ 7 39 52	-0.5282	.5473	+0.924	+9.6071	.9612
6	28 Pleiadum	7	+70	0	6 23.1	+ 7 44 21	+0.4443	.5474	+0.922	+9.5917	.9640
6	29 Pleiadum	8	+9	-57	6 26.0	+ 7 47 9	-0.5653	.5474	+0.921	+9.6079	.9610
6	s Pleiadum	7 $\frac{1}{2}$	+30	-34	6 38.9	+ 7 59 36	-0.1949	.5475	+0.917	+9.6024	.9620
6	f Pleiadum	4 $\frac{1}{2}$	+29	-35	6 44.6	+ 8 5 9	-0.2191	.5476	+0.915	+9.6029	.9620
6	h Pleiadum	5 $\frac{1}{2}$	+24	-40	6 45.2	+ 8 5 41	-0.3088	.5476	+0.915	+9.6043	.9617
6	30 Pleiadum	8 $\frac{1}{2}$	+29	-35	6 45.9	+ 8 6 27	-0.2170	.5476	+0.915	+9.6029	.9620
6	31 Pleiadum	8	+8	-58	6 47.3	+ 8 7 47	-0.5907	.5476	+0.915	+9.6088	.9608
6	32 Pleiadum	8	+9	-57	6 49.6	+ 8 10 0	-0.5709	.5476	+0.913	+9.6085	.9609
6	33 Pleiadum	8 $\frac{1}{2}$	+18	-47	6 51.8	+ 8 12 5	-0.4215	.5477	+0.913	+9.6063	.9613
6	34 Pleiadum	7 $\frac{1}{2}$	+52	-14	7 0.6	+ 8 20 35	+0.1786	.5477	+0.911	+9.5969	.9631
6	35 Pleiadum	9	+19	-46	7 1.0	+ 8 21 0	-0.4041	.5477	+0.911	+9.6062	.9613
6	36 Pleiadum	9	+20	-44	7 5.0	+ 8 24 53	-0.3689	.5478	+0.909	+9.6057	.9614
6	37 Pleiadum	8	+12	-53	7 5.6	+ 8 25 28	-0.5130	.5478	+0.909	+9.6080	.9610
6	39 Pleiadum	8	+4	-62	7 19.7	+ 8 39 7	-0.6534	.5479	+0.904	+9.6105	.9605
6	40 Pleiadum	7 $\frac{1}{2}$	+38	-26	7 31.7	+ 8 50 40	-0.0487	.5480	+0.900	+9.6013	.9623

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of Conj.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	Q'	Log sin D	Log cos D
June	10 δ Geminor.	3½	+36	-31	3 31.4	+ 1 36 16	-0.0887	.5588	-1218	+9.5779	.9664
	10 63 Geminor.	5½	+43	-25	6 54.6	+ 4 52 19	+0.0278	.5578	-1288	+9.5684	.9680
	11 ε Cancri	4½	+90	+20	2 55.4	+ 0 11 44	+0.9268	.5512	-1676	+9.4915	.9780
	11 δ² Cancri	6	+69	- 9	9 9.6	+ 6 13 12	+0.4383	.5489	-1781	+9.4783	.9794
	12 α Leonis	3½	+75	-10	20 25.2	- 7 41 11	+0.5321	.5378	-2260	+9.2614	.9926
	13 π Leonis	5	+60	-23	5 30.7	+ 1 6 42	+0.3163	.5359	-2345	+9.1800	.9950
	13 16 Sextantis	6	+90	+32	9 51.1	+ 5 18 42	+1.2112	.5353	-2379	+9.0763	.9969
	14 55 Leonis	6	+90	+36	8 9.3	+ 2 53 56	+1.2706	.5347	-2498	+8.4106	.9999
	14 ρ² Leonis	6	+90	+18	11 57.2	+ 6 34 35	+1.0659	.5351	-2510	+8.1132	0.0000
	14 ρ³ Leonis	5	+36	-46	16 48.3	+11 16 18	-0.0918	.5356	-2519	+8.0755	0.0000
	15 α Leonis	5	+88	+ 8	0 40.8	- 5 6 27	+0.9034	.5371	-2522	-8.5923	.9997
	15 B.A.C. 4006	6	+86	+ 2	10 27.3	+ 4 20 54	+0.8035	.5401	-2510	-8.9010	.9986
	17 69 Virginis	5½	+75	+35	5 55.1	- 1 40 17	+1.2337	.5627	-2175	-9.4202	.9844
	17 75 Virginis	6	+42	-35	8 14.6	+ 0 34 15	+0.1213	.5643	-2146	-9.4030	.9856
	17 87 Virginis	6	+73	+60	14 24.3	+ 6 30 28	+1.3490	.5687	-2042	-9.4700	.9802
	19 42 Libræ	5½	+38	-26	11 30.9	+ 1 52 16	+0.2632	.5963	-1085	-9.5984	.9628
	19 B.A.C. 5197	6	+66	+16	13 36.9	+ 3 53 10	+0.9546	.5992	-1030	-9.6140	.9598
	20 19 Scorpii	5½	-12	-87	2 48.5	- 7 27 50	-0.6130	.6041	-0660	-9.6065	.9613
	20 α Scorpii	3½	+65	+ 6	2 59.1	- 7 17 39	+0.8031	.6041	-0656	-9.6301	.9563
	20 22 Scorpii	5	+27	-33	6 23.1	- 4 2 8	+0.1458	.6048	-0560	-9.6227	.9579
	20 25 Scorpii	6	+36	-23	12 37.1	+ 1 56 17	+0.3255	.6056	-0371	-9.6304	.9563
	20 A Ophiuchi	5	+64	+46	23 18.2	-11 49 20	+1.2246	.6051	-0057	-9.6480	.9522
	21 39 Ophiuchi	5½	-47	-90	0 19.8	-10 50 14	-1.0807	.6051	-0026	-9.6115	.9603
	21 δ Ophiuchi	3½	- 2	-62	1 48.7	- 9 25 3	-0.3262	.6048	+0022	-9.6236	.9578
	21 δ Ophiuchi	5	-51	-90	3 28.3	- 7 49 33	-1.1374	.6044	+0074	-9.6101	.9606
	21 4 Sagittarii	5	-42	-90	16 8.8	+ 4 19 32	-1.0632	.6005	+0440	-9.6059	.9614
	22 26 Sagittarii	6	+33	-31	8 27.1	- 4 1 32	+0.1870	.5910	+0692	-9.6086	.9609
	22 ρ¹ Sagittarii	5	+ 2	-68	13 21.7	+ 0 41 28	-0.4129	.5880	+1012	-9.5903	.9643
	22 ρ² Sagittarii	5	0	-70	13 44.1	+ 1 3 4	-0.4480	.5875	+1025	-9.5890	.9645
	22 B.A.C. 6448	6	+29	-35	14 5.3	+ 1 23 22	+0.1038	.5875	+1032	-9.5980	.9629
	22 α Sagittarii	4	-28	-90	17 35.9	+ 4 45 49	-0.9543	.5845	+1120	-9.5724	.9674
	23 γ Sagittarii	5	- 2	-82	10 53.3	- 2 35 49	-0.5885	.5703	+1499	-9.5359	.9728
	23 57 Sagittarii	5½	-21	-90	13 22.9	- 0 11 42	-0.9279	.5678	+1551	-9.5212	.9746
	24 α Capricor.	5½	+71	+34	1 13.3	+11 13 37	+1.1912	.5572	+1756	-9.5245	.9742
	24 π Capricor.	5	+71	+10	4 46.7	- 9 20 35	+0.9076	.5537	+1816	-9.5051	.9765
	24 ε Capricor.	5	+68	- 7	5 28.8	- 8 39 58	+0.6248	.5533	+1826	-9.4961	.9775
	26 α Aquarii	5	+51	-31	21 4.4	+ 4 56 29	+0.1821	.5086	+2346	-8.9350	.9994
	27 α Piscium	4½	+74	-13	23 35.3	+ 6 42 28	+0.5670	.5006	+2354	+7.9407	0.0000
	29 δ Piscium	5½	+28	-56	4 58.5	+11 16 50	-0.2820	.4985	+2247	+9.1112	.9963
	30 γ Piscium	4	+29	-48	18 58.2	+ 0 12 15	-0.2263	.5098	+1945	+9.4024	.9857
July	1 δ Arietis	5½	-20	-71	18 49.6	- 0 38 47	-1.0380	.5213	+1653	+9.5182	.9750
	2 α Arietis	5½	+90	+ 5	6 49.4	+10 58 49	+0.6640	.5281	+1476	+9.5218	.9746
	2 47 Arietis	6	+90	+26	14 25.2	- 5 39 43	+0.9770	.5327	+1351	+9.5363	.9727
	2 α Arietis	4½	+60	-12	14 58.0	- 5 7 56	+0.3077	.5330	+1344	+9.5500	.9708
	3 γ Pleiadum	5½	+ 7	-60	12 19.7	- 8 28 3	-0.6047	.5454	+0951	+9.6067	.9612
	3 δ Pleiadum	4½	+18	-47	12 21.9	- 8 25 55	-0.4092	.5454	+0950	+9.6037	.9618
	3 η Pleiadum	7	-38	-66	12 28.7	- 8 19 23	-1.1937	.5455	+0948	+9.6160	.9594
	3 ε Pleiadum	5	- 4	-66	12 30.5	- 8 17 35	-0.7838	.5455	+0947	+9.6098	.9606
	3 1 Pleiadum	8	+24	-40	12 37.5	- 8 10 48	-0.2998	.5456	+0944	+9.6024	.9621
	3 2 Pleiadum	8½	- 3	-66	12 40.6	- 8 7 53	-0.7649	.5456	+0943	+9.6098	.9606
	3 3 Pleiadum	9	+22	-42	12 41.6	- 8 6 50	-0.3465	.5456	+0942	+9.6032	.9619
	3 4 Pleiadum	8	+ 6	-61	12 42.4	- 8 6 8	-0.6220	.5456	+0942	+9.6076	.9611
	3 5 Pleiadum	9	-15	-66	12 43.0	- 8 5 30	-0.9410	.5456	+0942	+9.6126	.9601
	3 6 Pleiadum	9	+ 9	-57	12 44.1	- 8 4 29	-0.5742	.5457	+0941	+9.6069	.9612
	3 c Pleiadum	5	+ 4	-62	12 47.7	- 8 0 58	-0.6495	.5457	+0940	+9.6082	.9609

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.						Log sin D	Log cos D
			North- ern.	South- ern.		H	Y	P'	q'				
July	3 7 Pleiadum	8	+25	-39	12 49.1	-7 59 35	-0.2968	0.5457	+0.0939	+9.6025	9.9630		
	3 B.A.C. 1155	7	+90	+13	12 49.3	-7 59 24	+0.6912	.5457	+0.0939	+9.5867	.9649		
	3 ϵ Pleiadum	7 $\frac{1}{2}$	-8	-66	12 49.7	-7 59 5	-0.8505	.5457	+0.0939	+9.6113	.9603		
	3 ζ Pleiadum	7 $\frac{1}{2}$	-6	-66	12 53.6	-7 55 18	-0.8160	.5457	+0.0938	+9.6108	.9604		
3	8 Pleiadum	8 $\frac{1}{2}$	+16	-49	12 59.1	-7 49 59	-0.4437	.5458	+0.0935	+9.6052	.9615		
	3 9 Pleiadum	8 $\frac{1}{2}$	+17	-48	13 0.1	-7 48 57	-0.4364	.5458	+0.0935	+9.6051	.9615		
	3 δ Pleiadum	5	+32	-33	13 2.1	-7 47 1	-0.1639	.5458	+0.0934	+9.6009	.9623		
	3 10 Pleiadum	8	+13	-52	13 5.2	-7 44 3	-0.5001	.5458	+0.0934	+9.6062	.9613		
3	11 Pleiadum	8 $\frac{1}{2}$	+23	-41	13 11.0	-7 38 27	-0.3256	.5458	+0.0931	+9.6036	.9618		
	3 12 Pleiadum	7 $\frac{1}{2}$	-4	-66	13 19.6	-7 30 11	-0.7704	.5458	+0.0929	+9.6108	.9604		
	3 13 Pleiadum	8 $\frac{1}{2}$	+30	-34	13 22.6	-7 27 17	-0.1910	.5458	+0.0928	+9.6018	.9622		
	3 14 Pleiadum	9	+45	-20	13 25.3	-7 24 39	+0.0645	.5458	+0.0927	+9.5978	.9629		
3	15 Pleiadum	8 $\frac{1}{2}$	+23	-42	13 26.0	-7 21 59	-0.3285	.5458	+0.0926	+9.6041	.9617		
	3 16 Pleiadum	9 $\frac{1}{2}$	+42	-23	13 28.6	-7 21 27	+0.0127	.5459	+0.0926	+9.5987	.9628		
	3 17 Pleiadum	8	+48	-17	13 29.2	-7 20 53	+0.1139	.5459	+0.0925	+9.5971	.9631		
	3 18 Pleiadum	8	+22	-42	13 29.3	-7 20 47	-0.3387	.5459	+0.0925	+9.6043	.9617		
3	ρ Pleiadum	7 $\frac{1}{2}$	+24	-41	13 30.1	-7 19 59	-0.3125	.5459	+0.0925	+9.6039	.9618		
	3 19 Pleiadum	8	+43	-22	13 30.5	-7 19 34	+0.0310	.5459	+0.0925	+9.5965	.9628		
	3 20 Pleiadum	8	-7	-66	13 30.8	-7 19 18	-0.8288	.5459	+0.0925	+9.6119	.9602		
	3 22 Pleiadum	8	+36	-28	13 31.9	-7 18 17	-0.0891	.5459	+0.0924	+9.6004	.9624		
3	21 Pleiadum	8 $\frac{1}{2}$	-12	-66	13 31.9	-7 18 14	-0.9024	.5459	+0.0924	+9.6131	.9599		
	3 23 Pleiadum	8 $\frac{1}{2}$	+51	-14	13 33.4	-7 16 50	+0.1721	.5459	+0.0924	+9.5963	.9632		
	3 24 Pleiadum	8	+13	-52	13 33.7	-7 16 33	-0.4961	.5459	+0.0924	+9.6069	.9612		
	3 γ Tauri	3 $\frac{1}{2}$	+25	-40	13 33.8	-7 16 28	-0.2952	.5459	+0.0924	+9.6037	.9618		
3	25 Pleiadum	8 $\frac{1}{2}$	+57	-13	13 37.9	-7 12 25	+0.2540	.5459	+0.0922	+9.5950	.9634		
	3 26 Pleiadum	9	+62	-6	13 40.7	-7 9 45	+0.3310	.5460	+0.0922	+9.5938	.9637		
	3 27 Pleiadum	8 $\frac{1}{2}$	+14	-51	13 53.9	-6 57 9	-0.4812	.5461	+0.0917	+9.6071	.9612		
	3 28 Pleiadum	7	+74	+2	13 58.5	-6 52 31	+0.4898	.5461	+0.0915	+9.5917	.9640		
3	29 Pleiadum	8	+12	-54	14 1.4	-6 49 43	-0.5188	.5462	+0.0914	+9.6079	.9610		
	3 σ Pleiadum	7 $\frac{1}{2}$	+33	-31	14 14.3	-6 37 15	-0.1494	.5463	+0.0910	+9.6024	.9621		
	3 ζ Pleiadum	4 $\frac{1}{2}$	+31	-33	14 20.0	-6 31 43	-0.1733	.5463	+0.0908	+9.6029	.9620		
	3 η Pleiadum	5 $\frac{1}{2}$	+26	-38	14 20.6	-6 31 10	-0.2628	.5463	+0.0908	+9.6043	.9617		
3	30 Pleiadum	8 $\frac{1}{2}$	+31	-32	14 21.4	-6 30 26	-0.1712	.5463	+0.0907	+9.6029	.9620		
	3 31 Pleiadum	8	+10	-55	14 22.7	-6 29 7	-0.5444	.5464	+0.0907	+9.6068	.9608		
	3 32 Pleiadum	8	+12	-54	14 25.1	-6 26 52	-0.5247	.5464	+0.0906	+9.6085	.9609		
	3 33 Pleiadum	8	+20	-44	14 27.2	-6 24 47	-0.3756	.5464	+0.0905	+9.6063	.9613		
3	34 Pleiadum	7 $\frac{1}{2}$	+55	-12	14 36.0	-6 16 18	+0.2237	.5465	+0.0902	+9.5969	.9631		
	3 35 Pleiadum	9	+21	-43	14 36.5	-6 15 52	-0.3583	.5465	+0.0902	+9.6062	.9613		
	3 36 Pleiadum	9	+23	-41	14 40.5	-6 11 59	-0.3230	.5465	+0.0901	+9.6057	.9614		
	3 37 Pleiadum	8	+15	-50	14 41.1	-6 11 25	-0.4670	.5465	+0.0901	+9.6080	.9610		
3	39 Pleiadum	8	+7	-59	14 55.2	-5 57 44	-0.6070	.5466	+0.0896	+9.6105	.9605		
	3 40 Pleiadum	7	+41	-23	15 7.2	-5 46 11	-0.0035	.5466	+0.0892	+9.6013	.9623		
	3 33 Tauri	6 $\frac{1}{2}$	+90	+40	17 57.9	-3 1 9	+1.0802	.5483	+0.0833	+9.5877	.9648		
	4 γ Tauri	5 $\frac{1}{2}$	-10	-66	5 24.1	+8 1 34	-0.8688	.5540	+0.0584	+9.6308	.9562		
5	132 Tauri	5 $\frac{1}{2}$	+79	+11	19 9.1	-3 33 35	+0.5339	.5660	-0.0303	+9.6180	.9569		
	5 139 Tauri	5 $\frac{1}{2}$	-32	-64	22 58.2	+0 7 18	-1.1907	.5664	-0.0397	+9.6408	.9539		
	10 α Leonis	3 $\frac{1}{2}$	+73	-12	2 18.3	-0 0 40	+0.5057	.5430	-0.2281	+9.6214	.9926		
	10 B.A.C. 3407	6	+55	-26	10 16.6	+7 41 56	+0.2503	.5411	-0.2357	+9.1930	.9946		
10	π Leonis	5	+58	-24	11 16.0	+8 39 23	+0.2899	.5406	-0.2365	+9.1800	.9950		
	11 34 Sextantis	6	+36	-46	7 24.3	+4 8 25	-0.0959	.5375	-0.2496	+8.8755	.9988		
	11 36 Sextantis	6	+90	-3	8 36.9	+5 18 38	+0.7183	.5376	-0.2497	+8.7487	.9993		
	11 ρ Leonis	5	+35	-47	22 13.7	-5 31 1	-0.1180	.5376	-0.2527	+8.0758	.0000		
12	ϵ Leonis	5	+88	+6	6 4.7	+2 4 45	+0.8760	.5383	-0.2528	+8.5923	.9997		
	14 69 Virginis	5 $\frac{1}{2}$	+75	+34	11 43.9	+5 55 53	+1.2226	.5572	-0.2154	+9.4992	.9844		
	16 42 Libræ	5 $\frac{1}{2}$	+38	-27	18 35.6	+10 44 34	+0.2582	0.5892	-0.1069	+9.5984	.9968		

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Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>P'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
July 17	19 Scorpii	5½	—13	—88	10 18.5	+ 1 49 50	—0.6273	0.5953	—0.654	—9.6064	9.9613
17	σ Scorpii	3½	+65	+ 6	10 29.4	+ 2 0 17	+0.8063	.5950	—0.642	—9.6302	.9563
17	22 Scorpii	5	+27	—33	13 58.9	+ 5 21 22	+0.1408	.5958	—0.648	—9.6228	.9579
18	A Ophiuchi	5	+64	+48	7 20.4	— 1 59 21	+1.2337	.5973	—0.055	—9.6480	.9522
18	39 Ophiuchi	5½	—45	—90	8 23.6	— 0 58 43	—1.0732	.5973	—0.018	—9.6116	.9603
18	δ Ophiuchi	3½	— 3	—62	9 54.6	+ 0 28 38	—0.3348	.5970	+0.021	—9.6236	.9578
18	δ Ophiuchi	5	—53	—90	11 36.6	+ 2 6 31	—1.1553	.5970	+0.084	—9.6101	.9606
18	B.A.C. 5909	6½	+64	+22	13 37.7	+ 4 2 41	+1.0205	.5965	+0.130	—9.6443	.9531
19	4 Sagittarii	5	—44	—90	0 34.1	— 9 27 16	—1.0777	.5939	+0.040	—9.6059	.9614
19	B.A.C. 6217	6½	+55	— 7	9 4.2	— 1 17 28	+0.5979	.5907	+0.069	—9.6256	.9573
19	24 Sagittarii	6	+27	—36	13 59.6	+ 3 26 19	+0.0940	.5883	+0.079	—9.6115	.9603
19	γ Sagittarii	5	+ 2	—68	22 10.0	+11 17 40	—0.4207	.5838	+0.106	—9.5903	.9643
19	γ Sagittarii	5	0	—71	22 32.8	+11 39 34	—0.4557	.5831	+0.109	—9.5890	.9645
20	σ Sagittarii	4	—29	—90	2 27.8	— 8 34 24	—0.9661	.5809	+0.112	—9.5724	.9673
20	B.A.C. 6607	6	+58	—10	9 1.5	— 2 15 34	+0.5526	.5765	+0.126	—9.5857	.9651
20	50 Sagittarii	6	+39	—28	11 24.4	+ 0 2 3	+0.2348	.5745	+0.131	—9.5745	.9670
20	f Sagittarii	5	— 3	—83	19 56.2	+ 8 14 57	—0.5973	.5685	+0.149	—9.5359	.9727
20	57 Sagittarii	5½	—22	—90	22 26.9	+10 40 32	—0.9385	.5663	+0.154	—9.5212	.9746
21	σ Capricor.	5½	+71	+33	10 20.8	— 1 51 9	+1.1871	.5576	+0.175	—9.5244	.9742
21	π Capricor.	5	+71	+10	13 54.7	+ 1 35 22	+0.9010	.5544	+0.181	—9.5051	.9765
21	ρ Capricor.	5	+68	— 7	14 36.9	+ 2 16 4	+0.6173	.5537	+0.182	—9.4961	.9775
21	B.A.C. 7043	6½	+45	—29	14 40.5	+ 2 19 35	+0.2318	.5537	+0.182	—9.4873	.9785
22	18 Aquarii	6	+75	— 1	16 31.9	+ 3 19 45	+0.7499	.5282	+0.212	—9.3671	.9879
22	B.A.C. 7620	6	+79	+44	7 5.9	— 6 33 33	+1.3198	.5247	+0.226	—9.2790	.9920
23	δ Aquarii	4½	+82	+56	18 55.0	+ 4 54 14	+1.3829	.5180	+0.232	—9.1680	.9962
24	α Aquarii	5	+49	—33	5 49.7	— 8 30 19	+0.1556	.5125	+0.236	—8.9347	9.9984
25	α Piscium	4½	+71	—15	8 2.2	— 7 2 48	+0.4940	.5043	+0.236	+7.9420	0.0000
25	16 Piscium	6	+90	+ 1	13 9.5	— 2 4 8	+0.7934	.5034	+0.237	+8.3686	9.9999
25	19 Piscium	6	+76	—12	18 34.5	+ 3 15 42	+0.5563	.5027	+0.231	+8.6766	.9995
26	d Piscium	5½	+22	—58	13 7.3	— 2 46 33	—0.3227	.5023	+0.225	+9.1113	.9963
26	45 Piscium	6	+90	+ 6	15 52.0	— 0 6 31	+0.8427	.5025	+0.221	+9.0815	.9968
28	γ Piscium	4	+26	—51	2 54.8	+ 9 56 34	—0.2745	.5101	+0.194	+9.4025	.9857
29	δ Arietis	5½	—24	—71	2 46.9	+ 9 6 15	—1.0884	.5202	+0.164	+9.5183	.9750
29	μ Arietis	5½	+85	+ 3	14 49.3	— 3 13 29	+0.6148	.5264	+0.147	+9.5218	.9746
29	ε Arietis	4½	+56	—14	23 0.5	+ 4 42 20	+0.2580	.5302	+0.137	+9.5501	.9708
30	66 Arietis	6½	+56	—12	12 54.8	— 5 50 11	+0.2497	.5383	+0.109	+9.5796	.9662
30	9 Tauri	6	+53	—14	16 53.9	— 2 8 57	+0.2013	.5400	+0.101	+9.5874	.9648
30	γ Pleiadum	5½	+ 4	—57	20 30.9	+ 1 30 56	—0.6536	.5421	+0.094	+9.6068	.9612
30	δ Pleiadum	4½	+15	—50	20 33.1	+ 1 33 6	—0.4569	.5421	+0.094	+9.6037	.9618
30	m Pleiadum	7	—46	—66	20 40.0	+ 1 39 34	—1.2425	.5422	+0.090	+9.6161	.9593
30	e Pleiadum	5	— 7	—66	20 41.8	+ 1 41 30	—0.8324	.5422	+0.093	+9.6098	.9606
30	1 Pleiadum	8	+22	—43	20 43.9	+ 1 48 22	—0.3476	.5422	+0.093	+9.6024	.9620
30	2 Pleiadum	8½	— 6	—66	20 52.0	+ 1 51 20	—0.8132	.5423	+0.096	+9.6098	.9606
30	3 Pleiadum	9	+19	—46	20 53.0	+ 1 52 21	—0.3942	.5423	+0.096	+9.6032	.9619
30	4 Pleiadum	8	+ 3	—64	20 53.8	+ 1 53 4	—0.6702	.5423	+0.096	+9.6076	.9611
30	5 Pleiadum	9	— 8	—66	20 54.4	+ 1 53 43	—0.9897	.5423	+0.096	+9.6126	.9601
30	6 Pleiadum	9	+ 6	—61	20 55.5	+ 1 54 44	—0.6224	.5423	+0.095	+9.6069	.9612
30	c Pleiadum	5	+ 1	—65	20 59.1	+ 1 58 15	—0.6979	.5423	+0.094	+9.6082	.9610
30	7 Pleiadum	8	+22	—42	21 0.6	+ 1 59 39	—0.3345	.5424	+0.093	+9.6025	.9621
30	B.A.C. 1155	7	+90	+26	21 0.8	+ 1 59 52	+0.6449	.5424	+0.093	+9.5868	.9649
30	k Pleiadum	7½	—12	—66	21 1.1	+ 2 0 10	—0.8993	.5424	+0.093	+9.6113	.9603
30	l Pleiadum	7½	— 9	—66	21 5.1	+ 2 4 0	—0.8642	.5424	+0.092	+9.6109	.9604
30	8 Pleiadum	8½	+14	—52	21 10.6	+ 2 9 20	—0.4915	.5425	+0.091	+9.6051	.9616
30	9 Pleiadum	8½	+14	—51	21 11.7	+ 2 10 22	—0.4842	.5425	+0.090	+9.6051	.9616
30	d Pleiadum	5	+29	—35	21 13.7	+ 2 12 18	—0.2166	.5425	+0.092	+9.6010	.9623

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	Q'	Log sin D	Log cos D
July	30 10 Pleiadum	8	+10	-56	21 16.8	+ 2 15 19	-0.5483	0.5425	+0.0928	+9.6062	9.9613
	30 11 Pleiadum	8	+20	-44	21 22.6	+ 2 20 54	-0.3736	0.5425	+0.0927	+9.6036	9.9618
	30 12 Pleiadum	7	- 6	-66	21 31.3	+ 2 29 19	-0.8185	0.5426	+0.0924	+9.6107	9.9604
	30 13 Pleiadum	8	+28	-36	21 34.2	+ 2 32 12	-0.2383	0.5426	+0.0923	+9.6018	9.9622
	30 14 Pleiadum	9	+42	-23	21 37.0	+ 2 34 50	+0.0174	0.5427	+0.0922	+9.5978	9.9629
	30 15 Pleiadum	8	+20	-44	21 39.8	+ 2 37 33	-0.3761	0.5427	+0.0920	+9.6042	9.9617
	30 16 Pleiadum	9	+39	-25	21 40.3	+ 2 38 6	-0.0344	0.5427	+0.0920	+9.5967	9.9628
	30 17 Pleiadum	8	+45	-20	21 40.9	+ 2 38 40	+0.0669	0.5427	+0.0920	+9.5970	9.9631
	30 18 Pleiadum	8	+20	-45	21 41.0	+ 2 38 45	-0.3861	0.5427	+0.0920	+9.6043	9.9617
	30 p Pleiadum	7	+21	-43	21 41.9	+ 2 39 34	-0.3598	0.5427	+0.0919	+9.6039	9.9618
	30 19 Pleiadum	8	+40	-24	21 42.3	+ 2 39 58	-0.0159	0.5427	+0.0919	+9.5984	9.9628
	30 20 Pleiadum	8	+10	-66	21 42.6	+ 2 40 14	-0.8772	0.5427	+0.0919	+9.6119	9.9602
	30 22 Pleiadum	8	+33	-31	21 43.6	+ 2 41 16	-0.1360	0.5427	+0.0919	+9.6004	9.9625
	30 21 Pleiadum	8	-16	-66	21 43.7	+ 2 41 19	-0.9506	0.5427	+0.0919	+9.6131	9.9600
	30 23 Pleiadum	8	+49	-17	21 45.2	+ 2 42 44	+0.1254	0.5427	+0.0918	+9.5962	9.9633
	30 24 Pleiadum	8	+11	-55	21 45.5	+ 2 43 3	-0.5439	0.5427	+0.0918	+9.6069	9.9612
	30 γ Tauri	3	+22	-43	21 45.5	+ 2 43 7	-0.3428	0.5427	+0.0918	+9.6086	9.9618
	30 25 Pleiadum	8	+54	-13	21 49.8	+ 2 47 11	+0.2071	0.5427	+0.0917	+9.5949	9.9635
	30 26 Pleiadum	9	+59	- 9	21 52.6	+ 2 49 55	+0.2843	0.5427	+0.0916	+9.5938	9.9637
	30 27 Pleiadum	8	+11	-54	22 5.8	+ 3 2 41	-0.5293	0.5428	+0.0912	+9.6071	9.9612
	30 28 Pleiadum	7	+70	0	22 10.5	+ 3 7 14	+0.4430	0.5428	+0.0908	+9.5917	9.9641
	30 29 Pleiadum	8	+ 9	-57	22 13.4	+ 3 10 2	-0.5666	0.5428	+0.0907	+9.6079	9.9610
	30 ε Pleiadum	7	+30	-34	22 26.4	+ 3 22 26	-0.1965	0.5429	+0.0904	+9.6023	9.9621
	30 ζ Pleiadum	4	+29	-35	22 32.2	+ 3 28 11	-0.2305	0.5430	+0.0903	+9.6027	9.9620
	30 η Pleiadum	5	+24	-40	22 32.7	+ 3 28 44	-0.3101	0.5430	+0.0903	+9.6042	9.9617
	30 30 Pleiadum	8	+29	-35	22 33.5	+ 3 29 30	-0.2184	0.5430	+0.0903	+9.6028	9.9620
	30 31 Pleiadum	8	+ 8	-58	22 34.9	+ 3 30 51	-0.5920	0.5431	+0.0902	+9.6067	9.9608
	30 32 Pleiadum	8	+ 9	-57	22 37.2	+ 3 33 5	-0.5723	0.5431	+0.0902	+9.6065	9.9609
	30 33 Pleiadum	8	+17	-47	22 39.4	+ 3 35 10	-0.4232	0.5431	+0.0902	+9.6062	9.9613
	30 34 Pleiadum	7	+52	-14	22 48.2	+ 3 43 44	+0.1770	0.5432	+0.0900	+9.5969	9.9631
	30 35 Pleiadum	9	+18	-46	22 48.7	+ 3 44 11	-0.4058	0.5432	+0.0900	+9.6062	9.9613
	30 36 Pleiadum	9	+20	-44	22 52.8	+ 3 48 9	-0.3704	0.5433	+0.0896	+9.6056	9.9615
	30 37 Pleiadum	8	+12	-53	22 53.4	+ 3 48 43	-0.5145	0.5433	+0.0896	+9.6060	9.9610
	30 39 Pleiadum	8	+ 4	-62	23 7.6	+ 4 2 28	-0.6548	0.5435	+0.0892	+9.6106	9.9605
	30 40 Pleiadum	7	+38	-26	23 19.7	+ 4 14 7	-0.0507	0.5436	+0.0889	+9.6013	9.9623
Aug.	31 γ Tauri	5	-13	-65	13 43.3	- 7 51 22	-0.0135	0.5509	+0.0585	+9.6202	9.9562
	2 132 Tauri	5	+80	+ 9	3 42.3	- 7 12 33	+0.5022	0.5638	-0.0301	+9.6180	9.9590
	2 139 Tauri	5	-34	-64	7 32.2	+10 29 5	-1.1492	0.5643	-0.0385	+9.6408	9.9539
	3 δ Geminor.	3	+35	-32	18 59.6	- 3 20 3	-0.1057	0.5717	-0.1242	+9.5779	9.9654
	3 63 Geminor.	5	+42	-26	22 18.5	- 0 8 21	+0.0117	0.5714	-0.1214	+9.5683	9.9680
	8 p Leonis	5	+39	-43	4 47.2	+ 2 50 6	-0.0441	0.5451	-0.2554	+8.0761	0.0000
	8 ε Leonis	5	+88	+11	12 27.2	+10 14 43	+0.9471	0.5456	-0.2554	-8.5923	9.9997
	10 69 Virginis	5	+75	+48	17 10.1	-10 50 32	+1.3219	0.5608	-0.2164	-9.4202	9.9844
	13 42 Libræ	5	+44	-21	0 4.2	- 5 59 30	+0.2612	0.5859	-0.1069	-9.5984	9.9628
	13 B.A.C. 5286	6	+66	+ 2	7 17.8	+ 0 57 11	+0.7487	0.5878	-0.0684	-9.6167	9.9592
	13 19 Scorpii	5	- 8	-78	15 59.5	+ 9 18 12	-0.5348	0.5899	-0.0650	-9.0065	9.9613
	13 σ Scorpii	3	+65	+13	16 10.5	+ 9 28 48	+0.9074	0.5899	-0.0646	-9.6201	9.9563
	13 22 Scorpii	5	+32	-27	19 43.3	-11 6 47	+0.2365	0.5903	-0.0546	-9.6228	9.9579
	14 39 Ophiuchi	5	-38	-90	14 29.1	+ 6 53 17	-0.9872	0.5903	-0.0246	-9.6116	9.9603
	14 δ Ophiuchi	3	+ 1	-57	16 1.3	+ 8 22 44	-0.2531	0.5902	+0.0015	-9.6336	9.9578
	14 b Ophiuchi	5	-47	-90	17 45.3	+10 2 42	-1.0814	0.5902	+0.0063	-9.6100	9.9606
	14 c Ophiuchi	5	-64	-90	19 44.9	+11 57 31	-1.2610	0.5898	+0.0118	-9.6068	9.9612
	15 4 Sagittarii	5	-39	-90	6 59.3	- 1 14 32	-1.0125	0.5967	+0.0426	-9.6059	9.9614
	16 1 Sagittarii	5	+ 4	-64	5 3.5	- 4 1 15	-0.3671	0.5769	+0.0988	-9.5943	9.9643
	16 2 Sagittarii	5	+ 2	-67	5 26.8	- 3 38 51	-0.4028	0.5765	+0.0998	-9.5890	9.9645

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	F	p'	q'	Log sin D	Log cos D
Aug. 16	B.A.C. 6485	6½	+20	-46	8 9.2	-1 2 30	-0.0774	0.5752	+1.057	-9.5898	9.9644
16	o Sagittarii	4	-26	-90	9 26.8	+0 12 12	-0.9206	.5741	+1.091	-9.5724	.9673
17	f Sagittarii	5	-1	-90	3 16.2	-6 37 19	-0.5665	.5631	+1.467	-9.5359	.9727
17	57 Sagittarii	5½	-21	-90	5 49.7	-4 9 19	-0.9135	.5610	+1.517	-9.5212	.9746
17	σ Capricor.	5½	+71	+37	17 55.9	+7 31 38	+1.2159	.5528	+1.730	-9.5244	.9742
17	π Capricor.	5	+72	+12	21 33.2	+11 1 30	+0.9230	.5500	+1.790	-9.5050	.9765
17	ε Capricor.	5	+69	-6	22 16.0	+11 42 51	+0.6364	.5479	+1.797	-9.4961	.9775
19	B.A.C. 7620	6	+79	+40	15 9.0	+3 17 21	+1.2856	.5242	+2.247	-9.2790	.9920
20	δ Aquarii	4½	+82	+45	3 0.6	-9 12 23	+1.3311	.5183	+2.315	-9.1680	.9952
20	κ Aquarii	5	+45	-36	13 55.8	+1 23 33	+0.0852	.5137	+2.354	-8.9347	9.9984
21	κ Piscium	4½	+64	-21	16 4.5	+2 47 15	+0.3881	.5068	+2.367	+7.9430	0.0000
21	g Piscium	6	+78	-11	16 14.7	+2 57 8	+0.5771	.5068	+2.367	+7.8052	0.0000
22	d Piscium	5½	+17	-67	21 0.6	+6 54 27	-0.4623	.5052	+2.259	+9.1114	9.9963
24	γ Piscium	4	+17	-61	10 38.5	+4 32 4	-0.4451	.5120	+1.943	+9.4025	.9857
24	101 Piscium	6	+90	+4	12 53.2	-2 21 18	+0.7399	.5127	+1.920	+9.3823	.9870
25	δ Arietis	5½	-44	-71	10 30.5	-5 22 28	-1.2717	.5206	+1.644	+9.5183	.9750
25	B.A.C. 782	6½	+90	+30	18 16.1	+2 8 57	+1.0602	.5236	+1.534	+9.4962	.9775
25	μ Arietis	5½	+68	-7	22 35.5	+6 20 23	+0.4323	.5258	+1.465	+9.5218	.9745
26	ε Arietis	4½	+45	-24	6 49.5	-9 41 0	+0.0740	.5294	+1.331	+9.5501	.9708
27	g Pleiadum	5½	-8	-66	4 31.2	+11 19 2	-0.8424	.5392	+0.937	+9.6068	.9612
27	b Pleiadum	5½	+5	-62	4 33.5	+11 21 13	-0.6427	.5392	+0.936	+9.6038	.9618
27	c Pleiadum	5	-21	-66	4 42.2	+11 29 42	-1.0198	.5392	+0.934	+9.6098	.9606
27	1 Pleiadum	8	+11	-55	4 49.4	+11 36 39	-0.5329	.5393	+0.932	+9.6024	.9620
27	2 Pleiadum	8½	-19	-66	4 52.6	+11 39 39	-1.0007	.5393	+0.931	+9.6098	.9606
27	3 Pleiadum	9	+8	-58	4 53.6	+11 40 42	-0.5797	.5393	+0.930	+9.6033	.9619
27	4 Pleiadum	8	-9	-66	4 54.4	+11 41 25	-0.8570	.5393	+0.930	+9.6076	.9611
27	5 Pleiadum	9	-36	-66	4 55.1	+11 42 4	-1.1776	.5393	+0.930	+9.6126	.9601
27	6 Pleiadum	9	-6	-66	4 56.1	+11 43 5	-0.8091	.5394	+0.930	+9.6069	.9612
27	c Pleiadum	5	-11	-66	4 59.8	+11 46 39	-0.8847	.5394	+0.928	+9.6082	.9609
27	7 Pleiadum	8	+12	-54	5 1.3	+11 48 6	-0.5199	.5394	+0.928	+9.6025	.9620
27	B.A.C. 1155	7	+66	-3	5 1.5	+11 48 17	+0.3903	.5394	+0.928	+9.5867	.9649
27	k Pleiadum	7½	-27	-66	5 1.8	+11 48 36	-1.0872	.5394	+0.928	+9.6113	.9603
27	l Pleiadum	7½	-24	-66	5 5.8	+11 52 28	-1.0524	.5394	+0.927	+9.6109	.9604
27	8 Pleiadum	8½	+3	-64	5 11.4	+11 57 53	-0.6778	.5394	+0.925	+9.6052	.9615
27	9 Pleiadum	8½	+3	-64	5 12.5	+11 58 55	-0.6705	.5396	+0.925	+9.6052	.9615
27	d Pleiadum	5	+18	-46	5 19.5	-11 59 8	-0.4014	.5395	+0.924	+9.6010	.9623
27	10 Pleiadum	8	-1	-66	5 17.6	-11 56 5	-0.7348	.5395	+0.923	+9.6063	.9613
27	11 Pleiadum	8½	+10	-56	5 23.5	-11 50 25	-0.5594	.5395	+0.921	+9.6037	.9618
27	12 Pleiadum	7½	-20	-66	5 32.3	-11 41 56	-1.0058	.5395	+0.918	+9.6108	.9604
27	13 Pleiadum	8½	+17	-47	5 35.3	-11 39 0	-0.4232	.5396	+0.917	+9.6018	.9622
27	14 Pleiadum	9	+32	-32	5 38.1	-11 36 20	-0.1665	.5396	+0.916	+9.5978	.9629
27	15 Pleiadum	8½	+9	-56	5 40.9	-11 33 36	-0.5618	.5396	+0.915	+9.6041	.9617
27	16 Pleiadum	9½	+29	-35	5 41.5	-11 33 3	-0.2183	.5396	+0.915	+9.5987	.9628
27	17 Pleiadum	8	+34	-30	5 42.1	-11 32 27	-0.1167	.5396	+0.915	+9.5971	.9631
27	18 Pleiadum	8	+9	-57	5 42.7	-11 31 52	-0.5711	.5396	+0.915	+9.6043	.9617
27	p Pleiadum	7½	+10	-55	5 43.0	-11 31 31	-0.5454	.5396	+0.915	+9.6039	.9618
27	19 Pleiadum	8	+30	-34	5 43.4	-11 31 9	-0.2000	.5396	+0.915	+9.5985	.9628
27	20 Pleiadum	8	-25	-66	5 43.7	-11 30 53	-1.0649	.5396	+0.915	+9.6120	.9602
27	22 Pleiadum	8	+23	-41	5 44.8	-11 29 47	-0.3206	.5396	+0.915	+9.6004	.9624
27	21 Pleiadum	8½	-32	-66	5 44.9	-11 29 45	-1.1387	.5396	+0.914	+9.6132	.9599
27	23 Pleiadum	8½	+38	-27	5 46.3	-11 28 22	-0.0581	.5396	+0.913	+9.5963	.9632
27	24 Pleiadum	8	-1	-66	5 46.6	-11 28 1	-0.7300	.5396	+0.913	+9.6069	.9612
27	γ Tauri	3½	+11	-54	5 46.7	-11 27 57	-0.5279	.5396	+0.913	+9.6037	.9618
27	25 Pleiadum	8½	+43	-22	5 51.0	-11 23 50	+0.0240	.5397	+0.911	+9.5951	.9634
27	26 Pleiadum	9	+47	-18	5 53.8	-11 21 4	+0.1019	.5397	+0.910	+9.5939	9.9636

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	Q'	Log sin D	Log cos D
Aug. 27	27 Pleiadum	8 $\frac{1}{2}$	0	-66	6 7.2	-11 8 9	-0.7156	0.5398	+0.0909	+0.6072	9.9611
	27 23 Pleiadum	7	+57	-10	6 12.0	-11 3 31	+0.2611	.5398	+0.0904	+0.5918	.9640
	27 29 Pleiadum	8	-2	-66	6 14.9	-11 0 40	-0.7529	.5398	+0.0903	+0.6079	.9610
	27 s Pleiadum	7 $\frac{1}{2}$	+20	-45	6 23.1	-10 47 58	-0.3312	.5399	+0.0899	+0.6024	.9621
	27 f Pleiadum	4 $\frac{1}{2}$	+18	-46	6 33.9	-10 42 22	-0.4051	.5400	+0.0897	+0.6029	.9620
	27 A Pleiadum	5 $\frac{1}{2}$	+13	-52	6 34.5	-10 41 45	-0.4955	.5400	+0.0897	+0.6044	.9617
	27 30 Pleiadum	8 $\frac{1}{2}$	+18	-46	6 35.3	-10 41 0	-0.4032	.5400	+0.0897	+0.6029	.9620
	27 31 Pleiadum	8	-4	-66	6 36.7	-10 39 37	-0.7785	.5400	+0.0896	+0.6068	.9608
	27 32 Pleiadum	8	-3	-66	6 39.0	-10 37 22	-0.7586	.5400	+0.0896	+0.6085	.9609
	27 33 Pleiadum	8 $\frac{1}{2}$	+7	-60	6 41.2	-10 36 16	-0.6087	.5400	+0.0895	+0.6063	.9613
	27 34 Pleiadum	7 $\frac{1}{2}$	+41	-24	6 50.1	-10 26 37	-0.0060	.5401	+0.0892	+0.5970	.9631
	27 35 Pleiadum	9	+8	-58	6 50.6	-10 26 9	-0.5913	.5401	+0.0892	+0.6062	.9613
	27 36 Pleiadum	9	+10	-56	6 54.7	-10 22 10	-0.5560	.5401	+0.0891	+0.6058	.9614
	27 37 Pleiadum	8	+1	-66	6 55.3	-10 21 35	-0.7009	.5402	+0.0891	+0.6060	.9610
	27 39 Pleiadum	8	-8	-66	7 9.8	-10 7 38	-0.8418	.5403	+0.0886	+0.6105	.9604
	27 40 Pleiadum	7 $\frac{1}{2}$	+28	-36	7 21.9	-9 55 52	-0.2349	.5404	+0.0883	+0.6014	.9623
	27 γ Tauri	5 $\frac{1}{2}$	-35	-65	21 56.6	+4 9 43	-1.1537	.5471	+0.0584	+0.6308	.9662
	28 103 Tauri	6	+90	+38	18 28.6	-0 0 27	+0.9705	.5541	+0.0127	+0.6107	.9604
	29 132 Tauri	5 $\frac{1}{2}$	+64	+1	12 31.6	-6 35 22	+0.3464	.5586	-0.2292	+0.6180	.9599
	31 δ Geminor.	3 $\frac{1}{2}$	+28	-38	4 23.4	+7 51 40	-0.2252	.5608	-1.2009	+0.5779	.9664
Sept. 1	31 56 Geminor.	5 $\frac{1}{2}$	+90	+61	5 13.8	+8 40 19	+1.2900	.5603	-1.2222	+0.5484	.9710
	31 63 Geminor.	5 $\frac{1}{2}$	+35	-32	7 44.4	+11 5 34	-0.1050	.5603	-1.278	+0.5684	.9680
	1 ϵ Cancri	4 $\frac{1}{2}$	+90	+13	3 23.9	+6 3 33	+0.8162	.5578	-1.692	+0.4914	.9780
	2 α Leonis	3 $\frac{1}{2}$	+73	-11	19 24.2	-3 19 1	+0.5144	.5522	-2.304	+0.2614	.9926
	9 42 Libræ	5 $\frac{1}{2}$	+57	-9	5 47.1	+1 30 49	+0.5624	.5912	-1.073	-0.5984	.9628
	9 B.A.C. 5197	6	+66	+50	7 56.0	+3 34 36	+1.2598	.5916	-1.018	-0.6140	.9598
	9 B.A.C. 5253	6	+66	+5	11 5.2	+6 36 18	+0.7902	.5921	-0.937	-0.6113	.9603
	9 B.A.C. 5254	6	+35	-28	11 6.8	+6 37 51	+0.2270	.5921	-0.934	-0.6018	.9622
	9 19 Scorpi	5 $\frac{1}{2}$	+3	-61	21 29.9	-7 23 59	-0.3243	.5932	-0.649	-0.6065	.9613
	9 σ Scorpii	3 $\frac{1}{2}$	+65	+30	21 40.8	-7 13 30	+1.1089	.5933	-0.646	-0.6301	.9563
	9 ρ Ophiuchi	5	-50	-90	23 26.2	-5 32 19	-1.1631	.5932	-0.694	-0.5941	.9636
	10 22 Scorpii	5	+45	-16	1 11.7	+3 51 4	+0.4420	.5932	-0.552	-0.6228	.9579
	10 25 Scorpii	6	+57	-5	7 39.3	+2 21 0	+0.6231	.5928	-0.464	-0.6304	.9563
	10 39 Ophiuchi	5 $\frac{1}{2}$	-28	-30	19 50.8	-9 56 44	-0.7887	.5909	-0.031	-0.6116	.9603
	10 θ Ophiuchi	3 $\frac{1}{2}$	+12	-44	21 23.6	-8 27 36	-0.0490	.5905	+0.017	-0.6226	.9578
	10 δ Ophiuchi	5	-33	-90	23 7.5	-6 47 35	-0.8760	.5902	+0.058	-0.6101	.9606
	11 c^2 Ophiuchi	5	-45	-90	1 7.0	-4 52 58	-1.0563	.5897	+0.111	-0.6067	.9612
	11 B.A.C. 6053	6 $\frac{1}{2}$	+29	-30	10 24.0	+4 2 5	+0.1990	.5861	+0.0368	-0.6226	.9578
	11 4 Sagittarii	5	-26	-90	12 22.8	+5 56 17	-0.8147	.5852	+0.0421	-0.6059	.9614
	12 γ^1 Sagittarii	5	+14	-52	10 36.2	+3 18 49	-0.1855	.5735	+0.0971	-0.5903	.9643
12	12 γ^2 Sagittarii	5	+12	-54	10 59.7	+3 41 28	-0.2216	.5732	+0.0978	-0.5890	.9645
	12 B.A.C. 6448	6	+42	-22	11 21.8	+4 2 47	+0.3402	.5727	+0.0991	-0.5980	.9629
	12 B.A.C. 6485	6 $\frac{1}{2}$	+30	-35	13 43.8	+6 19 23	+0.1022	.5714	+0.1042	-0.5898	.9644
	12 α Sagittarii	4	-15	-90	15 2.2	+7 35 0	-0.7449	.5707	+0.1070	-0.5724	.9673
	12 π Sagittarii	3	-53	-90	17 12.6	+9 40 34	-1.2385	.5696	+0.1117	-0.5590	.9694
	13 f Sagittarii	5	+7	-67	9 4.8	+1 3 40	-0.4091	.5588	+0.1441	-0.5359	.9727
	13 57 Sagittarii	5 $\frac{1}{2}$	-11	-90	11 40.4	+3 23 50	-0.7605	.5567	+0.1492	-0.5212	.9746
	14 π Capricor.	5	+72	+22	3 37.5	-5 6 39	+1.0634	.5455	+0.1766	-0.5050	.9765
	14 ρ Capricor.	5	+72	+2	4 21.0	-4 24 40	+0.7741	.5448	+0.1768	-0.4961	.9775
	14 B.A.C. 7097	6	+32	-42	7 23.8	-1 23 4	-0.0103	.5430	+0.1813	-0.4658	.9806
	14 γ^2 Capricor.	5	-61	-90	9 16.4	+0 21 0	-1.3384	.5420	+0.1836	-0.4251	.9840
	14 B.A.C. 7145	6 $\frac{1}{2}$	+34	-40	9 51.0	+0 54 23	+0.0151	.5414	+0.1846	-0.4562	.9815
	15 18 Aquarii	6	+77	+5	6 58.8	-2 38 8	+0.8412	.5286	+0.2090	-0.3670	.9879
	16 θ Aquarii	4 $\frac{1}{2}$	+82	+54	9 48.1	-0 37 18	+1.3731	.5158	+0.2232	-0.1680	.9952
	16 α Aquarii	5	+45	-36	20 49.6	+10 4 52	+0.0964	0.5119	+0.2324	-0.2347	9.9984

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	P'	q'	Log sin D	Log cos D
Sept. 17	α Piscium	4½	+60	-23	23 7.9	+11 38 15	+0.3410	0.5066	+2344	+7.9435	0.0000
18	19 Piscium	6	+62	-21	9 39.2	-2 8 8	+0.3675	.5059	+2322	+8.6771	9.9995
19	d Piscium	5½	+10	-75	4 6.8	-8 11 34	-0.5750	.5065	+2245	+9.1113	.9963
19	45 Piscium	6	+79	-9	6 49.2	-5 33 56	+0.5838	.5068	+2227	+9.0816	.9968
20	γ Piscium	4	+7	-73	17 41.6	+4 18 37	-0.6284	.5143	+1935	+9.4026	.9857
20	101 Piscium	6	+77	-6	19 56.1	+6 29 13	+0.5545	.5148	+1910	+9.3823	.9870
22	α Arietis	5½	+53	-19	5 37.7	-8 49 50	+0.3019	.5269	+1455	+9.5218	.9745
22	47 Arietis	6	+75	-1	13 19.5	-1 22 19	+0.5091	.5298	+1334	+9.5364	.9727
22	ε Arietis	4½	+32	-37	13 52.9	-0 49 59	-0.1658	.5302	+1321	+9.5501	.9708
22	ζ Arietis	4½	+90	+35	21 50.2	+6 52 54	+1.0752	.5332	+1190	+9.5450	.9715
23	g Pleiadum	5½	-28	-66	11 41.8	-3 42 48	-1.1015	.5386	+0.928	+9.6068	.9612
23	δ Pleiadum	4½	-12	-67	11 44.1	-3 40 33	-0.9030	.5386	+0.927	+9.6036	.9618
23	c Pleiadum	5	-56	-66	11 52.9	-3 32 1	-1.2817	.5387	+0.924	+9.6099	.9606
23	1 Pleiadum	8	-5	-67	12 0.1	-3 25 4	-0.7930	.5388	+0.922	+9.6024	.9621
23	2 Pleiadum	8½	-50	-56	12 3.2	-3 22 2	-1.2627	.5388	+0.921	+9.6098	.9606
23	3 Pleiadum	9	-8	-67	12 4.3	-3 20 59	-0.8399	.5388	+0.921	+9.6033	.9619
23	4 Pleiadum	8	-30	-66	12 5.1	-3 20 16	-1.1184	.5388	+0.920	+9.6076	.9610
23	6 Pleiadum	9	-26	-66	12 6.9	-3 18 30	-1.0700	.5388	+0.920	+9.6069	.9612
23	c Pleiadum	5	-33	-66	12 10.6	-3 14 56	-1.1466	.5388	+0.919	+9.6082	.9609
23	7 Pleiadum	8	-4	-67	12 12.1	-3 13 31	-0.7802	.5388	+0.918	+9.6025	.9620
23	B.A.C. 1155	7	+53	-13	12 12.2	-3 13 21	+0.2084	.5388	+0.918	+9.5867	.9649
23	8 Pleiadum	8½	-15	-66	12 22.8	-3 3 10	-0.9378	.5389	+0.915	+9.6053	.9615
23	9 Pleiadum	8½	-14	-66	12 23.4	-3 2 34	-0.9313	.5389	+0.915	+9.6052	.9615
23	d Pleiadum	5	+3	-64	12 25.4	-3 0 35	-0.6610	.5389	+0.914	+9.6010	.9623
23	10 Pleiadum	8	-19	-66	12 28.6	-2 57 31	-0.9959	.5389	+0.913	+9.6063	.9613
23	11 Pleiadum	8½	-7	-67	12 34.5	-2 51 48	-0.8193	.5389	+0.915	+9.6037	.9618
23	12 Pleiadum	7½	-52	-66	12 43.3	-2 43 16	-1.2682	.5389	+0.908	+9.6108	.9604
23	13 Pleiadum	8½	+2	-65	12 46.3	-2 40 20	-0.6828	.5388	+0.907	+9.6018	.9622
23	14 Pleiadum	9	+17	-48	12 49.1	-2 37 38	-0.4250	.5388	+0.906	+9.5978	.9629
23	15 Pleiadum	8½	-7	-67	12 52.0	-2 34 54	-0.8222	.5388	+0.905	+9.6042	.9617
23	16 Pleiadum	9½	+14	-51	12 52.5	-2 34 21	-0.4769	.5388	+0.905	+9.5987	.9628
23	17 Pleiadum	8	+20	-45	12 53.2	-2 33 44	-0.3749	.5388	+0.905	+9.5971	.9631
23	18 Pleiadum	8	-8	-67	12 53.3	-2 33 35	-0.8324	.5389	+0.905	+9.6043	.9617
23	p Pleiadum	7½	-6	-67	12 54.1	-2 32 49	-0.8058	.5389	+0.905	+9.6039	.9618
23	19 Pleiadum	8	+15	-50	12 54.5	-2 32 25	-0.4586	.5389	+0.905	+9.5985	.9628
23	22 Pleiadum	8	+8	-58	12 55.9	-2 31 3	-0.5799	.5389	+0.904	+9.6004	.9624
23	23 Pleiadum	8½	+23	-41	12 57.5	-2 29 35	-0.3161	.5389	+0.904	+9.5963	.9632
23	24 Pleiadum	8	-19	-66	12 57.8	-2 29 16	-0.9913	.5389	+0.904	+9.6069	.9612
23	γ Tauri	3½	-5	-67	12 57.9	-2 29 9	-0.7885	.5389	+0.904	+9.6037	.9618
23	25 Pleiadum	8½	+28	-36	13 2.1	-2 25 3	-0.2337	.5390	+0.903	+9.5951	.9634
23	26 Pleiadum	9	+32	-32	13 5.0	-2 22 18	-0.1556	.5390	+0.902	+9.5939	.9636
23	27 Pleiadum	8½	-18	-66	13 19.0	-2 8 43	-0.9734	.5390	+0.897	+9.6072	.9611
23	28 Pleiadum	7	+41	-23	13 23.3	-2 4 33	+0.0043	.5390	+0.896	+9.5918	.9640
23	29 Pleiadum	8	-22	-66	13 26.3	-2 1 39	-1.0151	.5391	+0.895	+9.6079	.9610
23	ρ Pleiadum	7½	+4	-62	13 39.5	-1 48 52	-0.6412	.5392	+0.891	+9.6024	.9621
23	σ Pleiadum	4½	+3	-64	13 45.5	-1 43 9	-0.6656	.5392	+0.890	+9.6030	.9620
23	λ Pleiadum	5½	-3	-66	13 46.0	-1 42 36	-0.7561	.5392	+0.889	+9.6043	.9617
23	30 Pleiadum	8½	+3	-64	13 46.8	-1 41 50	-0.6635	.5392	+0.889	+9.6030	.9620
23	31 Pleiadum	8	-23	-66	13 48.2	-1 40 27	-1.0411	.5392	+0.888	+9.6088	.9608
23	32 Pleiadum	8	-21	-66	13 50.6	-1 38 10	-1.0207	.5392	+0.888	+9.6086	.9609
23	33 Pleiadum	8½	-10	-66	13 52.8	-1 36 4	-0.8702	.5393	+0.887	+9.6063	.9613
23	34 Pleiadum	7½	+26	-38	14 1.9	-1 27 16	-0.2644	.5393	+0.884	+9.5970	.9631
23	35 Pleiadum	9	-10	-66	14 2.3	-1 26 52	-0.8525	.5393	+0.884	+9.6063	.9613
23	36 Pleiadum	9	-7	-66	14 6.4	-1 22 51	-0.8174	.5394	+0.883	+9.6058	.9614
23	37 Pleiadum	8	-17	-66	14 7.1	-1 22 15	-0.9627	0.5394	+0.882	+9.6081	9.9610

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			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D
Sept. 23	39 Pleiadum	8	-29	-06	14 21.6	-1 8 12	-1.1048	0.5395	+0.0878	+9.6106	9.9885
	40 Pleiadum	7½	+13	-52	14 33.9	-0 56 19	-0.4945	.5396	+0.0874	+9.6014	.9623
	33 Tauri	6	+85	+9	17 29.6	+1 53 40	+0.6009	.5405	+0.0812	+9.5878	.9647
	121 Tauri	6	+90	+29	14 27.0	-2 39 38	+0.8383	.5508	-0.0159	+9.6084	.9609
	132 Tauri	5½	+46	-13	20 33.7	+3 8 38	+0.0797	.5527	-0.0808	+9.6180	.9689
26	1 Geminor.	5	+90	+54	3 19.6	+9 46 20	+1.1921	.5534	-0.0436	+9.5966	.9632
27	8 Geminor.	3½	+14	-53	13 21.0	-5 22 49	-0.4773	.5531	-0.1179	+9.5779	.9664
27	56 Geminor.	5½	+90	+34	14 12.7	-4 39 51	+1.0541	.5528	-0.1197	+9.5483	.9710
27	63 Geminor.	5½	+21	-46	16 47.2	-2 3 45	-0.3526	.5527	-0.1252	+9.5684	.9680
28	7 Cancri	4½	+82	+2	12 56.0	-6 36 29	+0.6008	.5523	-0.1646	+9.4914	.9780
28	d ² Cancri	6	+48	-25	19 8.8	-0 36 16	+0.1325	.5514	-0.1750	+9.4781	.9794
30	e Leonis	3½	+62	-18	5 43.0	+8 47 50	+0.3637	.5490	-0.2255	+9.2614	.9986
30	16 Leonis	5	+52	-28	14 28.8	-6 44 2	+0.1940	.5483	-0.2348	+9.1680	.9950
30	π Sextantis	6	+90	+23	18 38.6	-2 42 36	+0.1892	.5484	-0.2384	+9.0763	.9999
Oct. 2	p ¹ Leonis	6	+39	-42	0 2.6	+1 41 39	-0.0818	.5537	-0.2547	+8.0891	0.0000
6	42 Libræ	5½	+67	+3	13 35.9	+11 7 24	+0.7679	.6024	-0.1076	-0.5894	9.9688
6	8 Scorpii	2½	-43	-00	21 11.6	-5 35 44	-1.1036	.6068	-0.0871	-0.5778	.9665
6	19 Scorpii	5½	+16	-46	4 48.5	+1 42 18	-0.0654	.6033	-0.0651	-0.6064	.9613
7	e Ophiuchi	5	-30	-09	6 41.3	+3 30 26	-0.9085	.6038	-0.0586	-0.5941	.9636
7	22 Scorpii	5	+62	-2	8 23.6	+5 8 25	+0.6730	.6035	-0.0553	-0.6228	.9679
8	30 Ophiuchi	5½	-11	-77	2 31.0	-1 28 54	-0.5180	.5995	-0.0133	-0.6115	.9603
8	8 Ophiuchi	3½	+26	-29	4 1.4	-0 2 16	+0.9069	.5988	+0.0013	-0.6226	.9578
8	b Ophiuchi	5	-17	-86	5 42.7	+1 34 59	-0.6074	.5983	+0.0067	-0.6101	.9606
8	c ² Ophiuchi	4	-27	-90	7 39.2	+3 26 45	-0.7845	.5976	+0.0129	-0.6068	.9612
8	4 Sagittarii	5	-10	-78	18 39.6	-9 59 25	-0.5409	.5944	+0.0426	-0.6069	.9614
9	24 Sagittarii	6	+59	-6	8 11.9	+3 0 55	+0.6132	.5634	+0.0773	-0.6115	.9603
9	B.A.C. 6343	6	+35	-27	10 4.7	+4 49 24	+0.2369	.5622	+0.0290	-0.6028	.9620
9	26 Sagittarii	6	+65	-1	11 25.7	+6 7 16	+0.7006	.5810	+0.0857	-0.6086	.9609
9	v ¹ Sagittarii	5	+28	-36	16 19.6	+10 49 40	+0.0865	.5772	+0.0977	-0.5843	.9654
9	8 Sagittarii	5	+26	-38	16 52.8	+11 23 0	+0.0512	.5774	+0.0863	-0.5890	.9645
9	e Sagittarii	4	0	-71	20 52.2	-8 47 36	-0.4688	.5745	+0.1074	-0.5724	.9673
9	π Sagittarii	3	-28	-90	23 1.0	-6 43 34	-0.9655	.5727	+0.1121	-0.5590	.9694
10	50 Sagittarii	6	+68	0	6 0.3	+0 0 23	+0.7187	.5669	+0.1266	-0.5745	.9670
10	B.A.C. 6671	6	+56	-13	7 58.9	+1 54 37	+0.5010	.5666	+0.1308	-0.5659	.9684
10	f Sagittarii	5	+21	-49	14 45.8	+8 27 4	-0.1465	.5699	+0.1439	-0.5369	.9727
10	57 Sagittarii	5½	+3	-73	17 19.5	+10 55 19	-0.4987	.5680	+0.1484	-0.5312	.9746
11	π Capricor.	5	+72	+53	9 13.6	+2 16 45	+1.3161	.5451	+0.1742	-0.5051	.9765
11	e Capricor.	5	+72	+20	9 57.0	+2 58 41	+1.0278	.5448	+0.1753	-0.4951	.9775
11	B.A.C. 7043	6½	+69	-6	10 0.8	+3 2 19	+0.6383	.5446	+0.1754	-0.4873	.9785
11	B.A.C. 7097	6	+46	-27	13 4.7	+6 0 13	+0.2420	.5425	+0.1798	-0.4659	.9806
11	r ² Capricor.	5	-29	-80	14 52.4	+7 44 20	-1.0842	.5414	+0.1829	-0.4251	.9840
12	18 Aquarii	6	+77	+21	12 48.5	+4 58 55	+1.0681	.5264	+0.2066	-0.3671	.9879
14	z Aquarii	5	+54	-27	2 45.2	-6 12 4	+0.2549	.5092	+0.2289	-0.8347	9.9984
15	z Piscium	4½	+67	-17	5 15.6	-4 26 30	+0.4394	.5047	+0.2311	-0.79437	0.0000
15	9 Piscium	6	+82	-7	5 25.9	-4 16 32	+0.6287	.5046	+0.2310	-0.78068	0.0000
15	16 Piscium	6	+90	-3	10 24.9	+0 34 5	+0.7110	.5044	+0.2308	+8.3691	9.9999
15	19 Piscium	6	+67	-17	15 51.1	+5 51 13	+0.4397	.5044	+0.2290	+8.6744	.9995
16	d Piscium	5½	+11	-73	10 24.3	-0 6 40	-0.5531	.5068	+0.2215	+9.1115	.9963
16	45 Piscium	6	+80	-7	13 9.5	+2 33 48	+0.6022	.5063	+0.2201	+9.0816	.9968
18	γ Piscium	4	+2	-75	0 3.8	-11 32 1	-0.7901	.5155	+0.1915	+9.4025	.9657
19	B.A.C. 782	6½	+90	+7	7 38.0	-4 54 3	+0.6967	.5270	+0.1506	+9.4963	.9775
19	μ Arietis	5½	+44	-26	11 57.4	-0 42 40	+0.0587	.5288	+0.1441	+9.5219	.9745
19	47 Arietis	6	+62	-10	19 39.0	+6 44 38	+0.3468	.5219	+0.1314	+9.5364	.9727
19	ε Arietis	4½	+22	-46	20 11.9	+7 16 28	-0.3311	.5319	+0.1308	+9.5501	.9708
20	ζ Arietis	4½	+90	+23	3 48.7	-9 21 9	+0.8984	0.5362	+0.1123	+9.5450	9.9715

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of C.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	I	P'	Q'	Log sin D	Log cos D	
					h m	h m s						
Oct. 20	α Arietis	5	+00	+40	6 50.9	- 6 25 45	+1.1176	0.5362	+1.121	+9.5473	9.9712	
20	δ Pleiadum	4 $\frac{1}{2}$	-30	-67	18 2.5	+ 4 25 19	-1.1089	.5400	+0.0913	+9.6038	.9618	
20	B.A.C. 1155	7	+41	-23	18 30.7	+ 4 52 38	+0.0061	.5401	+0.0904	+9.5867	.9649	
20	δ Pleiadum	5	-10	-67	18 43.9	+ 5 5 20	-0.8666	.5402	+0.0900	+9.6010	.9623	
20	ρ Pleiadum	7 $\frac{1}{2}$	-21	-67	19 12.6	+ 5 33 10	-1.0104	.5405	+0.0890	+9.6039	.9618	
20	γ Tauri	3 $\frac{1}{2}$	-20	-67	19 16.4	+ 5 36 47	-0.9954	.5406	+0.0889	+9.6037	.9618	
20	δ Pleiadum	7	+29	-34	19 41.8	+ 6 1 25	-0.2013	.5407	+0.0882	+9.5918	.9640	
20	ϵ Pleiadum	7 $\frac{1}{2}$	-10	-67	19 58.1	+ 6 17 8	-0.8490	.5408	+0.0877	+9.6024	.9621	
20	f Pleiadum	4 $\frac{1}{2}$	-11	-67	20 3.9	+ 6 23 50	-0.8732	.5408	+0.0875	+9.6029	.9620	
20	λ Pleiadum	5 $\frac{1}{2}$	-18	-66	20 4.6	+ 6 23 24	-0.9642	.5408	+0.0875	+9.6044	.9617	
20	β Pleiadum	7 $\frac{1}{2}$	+14	-50	20 30.4	+ 6 38 44	-0.4718	.5409	+0.0870	+9.5970	.9631	
20	B.A.C. 1189	7	+90	+47	20 28.0	+ 6 46 5	+1.1682	.5409	+0.0869	+9.5702	.9677	
20	40 Pleiadum	7 $\frac{1}{2}$	0	-66	20 52.5	+ 7 9 44	-0.7026	.5411	+0.0869	+9.6014	.9623	
22	103 Tauri	6	+71	+9	8 35.5	- 6 18 28	+0.4582	.5494	+0.112	+9.6107	.9604	
22	121 Tauri	6	+53	+15	21 2.4	+ 5 43 16	+0.5784	.5506	-0.157	+9.5926	.9609	
23	132 Tauri	5 $\frac{1}{2}$	+30	-28	3 11.0	+11 39 20	-0.1912	.5507	-0.0222	+9.6180	.9690	
23	1 Geminor.	5	+90	+32	10 4.6	- 5 41 7	+0.9249	.5506	-0.0443	+9.5966	.9632	
23	2 Geminor.	6 $\frac{1}{2}$	+71	+5	11 17.2	- 4 31 2	+0.4539	.5507	-0.0469	+9.6032	.9619	
23	3 Geminor.	6	+90	+34	12 37.7	- 3 13 11	+0.9515	.5506	-0.0502	+9.5942	.9636	
23	5 Geminor.	6	+11	-51	13 24.5	- 2 27 59	-0.5259	.5506	-0.0519	+9.6168	.9692	
23	6 Geminor	6	+90	+45	13 48.2	- 2 4 58	+1.1064	.5506	-0.0526	+9.5907	.9642	
23	μ Geminor.	6	+90	+55	18 40.0	+ 2 36 46	+1.2114	.5500	-0.0631	+9.5843	.9654	
24	π Geminor.	3 $\frac{1}{2}$	-4	-68	20 46.9	+ 3 50 45	-0.7749	.5466	-0.1169	+9.5779	.9664	
24	56 Geminor.	5 $\frac{1}{2}$	+90	+15	21 39.9	+ 4 42 0	+0.7740	.5465	-0.1187	+9.5480	.9710	
25	63 Geminor.	5 $\frac{1}{2}$	+4	-66	0 18.2	+ 7 15 1	-0.6503	.5464	-0.1236	+9.5684	.9680	
25	ζ Cancri	4 $\frac{1}{2}$	+60	-14	21 0.9	+ 3 16 18	+0.3165	.5428	-0.1613	+9.4914	.9780	
27	ϵ Leonis	3 $\frac{1}{2}$	+47	-31	15 5.9	- 4 1 16	+0.1138	.5890	-0.2202	+9.2614	.9926	
28	π Leonis	5	+38	-41	0 8.3	+ 4 43 34	-0.0452	.5394	-0.2293	+9.1890	.9950	
28	36 Sextantis	6	+74	-12	21 20.7	+ 1 14 18	+0.5304	.5429	-0.2444	+8.7487	9.9993	
29	ρ Leonis	5	+30	-51	10 38.1	- 9 54 59	-0.1964	.5475	-0.2497	+8.0754	0.0000	
29	ϵ Leonis	5	+88	+5	18 13.1	- 2 35 8	+0.8437	.5502	-0.2504	-8.5924	9.9997	
Nov. 3	19 Scorpii	5 $\frac{1}{2}$	+24	-37	14 42.4	-10 34 44	+0.0658	.6104	-0.0638	-9.6064	.9613	
3	ϵ Ophiuchi	5	-20	-90	16 32.8	- 8 50 1	-0.7418	.6142	-0.0960	-9.5940	.9636	
3	22 Scorpii	5	+65	+8	18 12.0	- 7 15 7	+0.8218	.6145	-0.0542	-9.6228	.9579	
4	39 Ophiuchi	5 $\frac{1}{2}$	-3	-61	11 44.4	+ 9 32 26	-0.3260	.6109	-0.0009	-9.6115	.9603	
4	δ Ophiuchi	3 $\frac{1}{2}$	+38	-18	13 11.9	+10 56 15	+0.3970	.6107	+0.0631	-9.6236	.9578	
4	δ Ophiuchi	5	-6	-66	14 49.9	-11 29 55	-0.4018	.6101	+0.0083	-9.6101	.9606	
4	ϵ Ophiuchi	5	-15	-82	16 42.5	- 9 42 1	-0.5727	.6091	+0.0139	-9.6068	.9612	
5	4 Sagittarii	5	+2	-60	2 20.7	+ 0 29 32	-0.3166	.6040	+0.0442	-9.6069	.9614	
6	γ Sagittarii	5	+42	-22	0 27.7	- 3 14 28	+0.3279	.5875	+0.1001	-9.5903	.9643	
6	γ Sagittarii	5	+40	-24	0 50.2	- 2 52 52	+0.3980	.5874	+0.1009	-9.5890	.9645	
6	ϵ Sagittarii	4	-47	-90	1 55.3	- 1 50 14	-1.1749	.5865	+0.1034	-9.5599	.9693	
6	ϵ Sagittarii	4	+13	-53	4 42.0	+ 0 50 0	-0.2137	.5840	+0.1100	-9.5724	.9673	
6	π Sagittarii	3	-12	-90	6 46.9	+ 2 50 3	-0.6937	.5822	+0.1147	-9.5590	.9694	
6	f Sagittarii	5	+35	-33	22 3.8	- 6 27 48	+0.1249	.5682	+0.1462	-9.5359	.9727	
7	57 Sagittarii	5 $\frac{1}{2}$	+18	-54	0 33.8	- 4 2 47	-0.2196	.5651	+0.1518	-9.5212	.9746	
7	ϵ Capricor.	5	+72	+47	16 46.9	+11 36 13	+1.2880	.5509	+0.1773	-9.4961	.9775	
7	γ Capricor.	5	-10	-90	21 26.0	- 7 44 28	-0.7976	.5468	+0.1840	-9.4251	.9840	
9	30 Aquarii	5 $\frac{1}{2}$	-26	-90	14 43.2	+ 8 4 58	-1.1285	.5175	+0.2210	-9.0972	.9966	
10	π Aquarii	5	+70	-14	8 45.7	+ 1 35 52	+0.4991	.5098	+0.2277	-8.9347	9.9984	
11	B.A.C. 8152	6 $\frac{1}{2}$	+90	+38	9 22.5	+ 1 30 52	+1.2767	.5036	+0.2269	-7.9065	0.0000	
11	π Piscium	4 $\frac{1}{2}$	+84	-6	11 13.8	+ 3 19 1	+0.6466	.5035	+0.2289	+7.9427	.0000	
11	9 Piscium	6	+90	+4	11 24.1	+ 3 29 2	+0.8394	.5023	+0.2287	+7.8091	0.0000	
12	δ Piscium	5 $\frac{1}{2}$	+19	-62	16 26.0	+ 7 42 25	-0.3991	.5042	+0.2189	+9.1115	9.9963	
14	γ Piscium	4	+6	-72	6 10.9	- 3 37 7	-0.6263	0.5144	+0.1891	+9.4026	9.9857	

**ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.**

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
					h m s	h m s						
Nov. 14	101 Piscium	6	+76	-6	8 25.6	-1 26 17	+0.5487	0.5154	+1.1655	+9.3824	9.9870	
15	B.A.C. 782	6½	+90	+8	13 46.0	+3 1 24	+0.7031	.5277	+1.487	+9.4963	.9775	
15	μ Arietis	5½	+43	-26	18 5.0	+7 12 26	+0.0498	.5285	+1.423	+9.5219	.9745	
16	α Arietis	4½	+21	-47	2 18.6	-8 49 24	-0.3509	.5333	+1.291	+9.5501	.9708	
16	ζ Arietis	4½	+90	+21	9 54.2	-1 28 12	+0.8634	.5365	+1.160	+9.5450	.9715	
16	τ¹ Arietis	5	+90	+37	12 55.8	+1 27 38	+1.0767	.5378	+1.106	+9.5473	.9712	
17	δ Pleiadum	4½	-36	-67	0 5.1	-11 44 38	-1.1698	.5423	+0.899	+9.6038	.9618	
17	d Pleiadum	5	-15	-67	0 46.3	-11 4 47	-0.9292	.5426	+0.885	+9.6010	.9623	
17	η Tauri	3½	-25	-67	1 18.7	-10 33 28	-1.0590	.5427	+0.874	+9.6038	.9618	
17	f Pleiadum	4½	-16	-67	2 6.1	-9 47 37	-0.9385	.5430	+0.859	+9.6030	.9620	
17	λ Pleiadum	5½	-23	-66	2 6.7	-9 47 1	-1.0294	.5430	+0.859	+9.6044	.9617	
17	32 Tauri	6	+90	+40	5 44.9	-6 15 58	+1.0802	.5442	+0.786	+9.5751	.9669	
17	33 Tauri	6	+60	-6	5 49.6	-6 11 25	+0.3183	.5442	+0.785	+9.5878	.9647	
18	103 Tauri	6	+61	+2	14 28.8	+1 22 23	+0.3302	.5520	+0.097	+9.6107	.9604	
19	132 Tauri	5½	+21	-37	9 1.7	-4 42 36	-0.3451	.5530	-0.037	+9.6180	.9590	
19	1 Geminor.	5	+90	+22	15 55.0	+1 56 42	+0.7636	.5526	-0.0458	+9.5966	.9632	
19	2 Geminor.	6½	+58	-4	17 7.6	+3 6 49	+0.2898	.5523	-0.0484	+9.6032	.9619	
19	3 Geminor.	6	+90	+23	18 28.2	+4 24 39	+0.7865	.5521	-0.0516	+9.5942	.9636	
19	6 Geminor	6	+90	+33	19 38.9	+5 32 59	+0.9437	.5517	-0.0541	+9.5907	.9642	
20	μ Geminor.	3	+90	+39	0 29.8	+10 14 1	+1.0411	.5514	-0.0646	+9.5843	.9654	
20	d Geminor.	6	+90	+16	13 85.0	-1 7 12	+0.7367	.5492	-0.0917	+9.5721	.9674	
21	δ Geminor.	3½	-18	-68	2 45.2	+11 36 29	-0.9815	.5461	-1.177	+9.5779	.9664	
21	56 Geminor.	5½	+80	+4	3 38.7	-11 31 49	+0.5751	.5459	-1.195	+9.5484	.9710	
21	63 Geminor.	5½	-9	-68	6 18.5	-8 57 20	-0.8598	.5454	-1.242	+9.5684	.9680	
21	g Geminor.	5½	+90	+36	14 58.2	-0 34 47	+1.1117	.5430	-1.401	+9.5092	.9761	
22	ζ Cancri	4½	+46	-26	3 16.8	+11 19 39	+0.0985	.5396	-1.1608	+9.4914	.9781	
23	λ Leonis	6	+90	+23	17 50.6	+0 39 31	+1.0566	.5317	-2.124	+9.2533	.9929	
23	α Leonis	3½	+34	-44	22 19.9	+5 0 21	-0.1146	.5312	-2.169	+9.2613	.9926	
24	π Leonis	5	+26	-54	7 39.0	-9 58 7	-0.2730	.5310	-2.253	+9.1799	.9950	
25	p¹ Leonis	6	+90	-2	14 29.6	-4 6 3	+0.7197	.5353	-2.225	+8.1119	0.0000	
25	p² Leonis	5	+19	-64	19 21.1	+0 36 4	-0.3992	.5367	-2.236	+8.0747	0.0000	
26	ε Leonis	5	+86	-5	3 12.8	+8 12 30	+0.6685	.5303	-2.444	+8.5923	.9997	
Dec. 3	B.A.C. 6343	6	+57	-8	4 43.8	+3 4 31	+0.5754	.6037	+0.075	-9.6025	.9620	
3	26 Sagittarii	6	+66	+23	6 0.1	+4 17 41	+1.0285	.6016	+0.095	-9.6086	.9609	
3	¹ Sagittarii	5	+49	-15	10 46.4	+8 52 21	+0.4407	.5972	+1.028	-9.5903	.9643	
3	² Sagittarii	5	+47	-17	11 8.2	+9 13 19	+0.4066	.5972	+1.034	-9.5890	.9645	
3	ξ Sagittarii	4	-34	-90	12 11.6	+10 14 7	-1.0330	.5965	+1.061	-9.5599	.9693	
3	ο Sagittarii	4	+20	-45	14 53.6	-11 10 22	-0.0867	.5943	+1.128	-9.5724	.9673	
3	π Sagittarii	3	-4	-79	16 54.9	-9 13 51	-0.5578	.5922	+1.177	-9.5590	.9694	
4	f Sagittarii	5	+43	-25	7 43.7	+5 0 37	+0.2673	.5780	+1.497	-9.5359	.9727	
4	57 Sagittarii	5½	+25	-44	10 9.5	+7 20 58	-0.0692	.5762	+1.544	-9.5212	.9746	
5	B.A.C. 7097	6	+72	-4	4 49.5	+1 20 30	+0.6691	.5582	+1.1854	-9.4659	.9806	
5	τ² Capricor.	5	0	-83	6 32.0	+2 59 27	-0.6200	.5564	+1.1879	-9.4251	.9840	
5	B.A.C. 7145	6½	+73	-3	7 4.8	+3 31 6	+0.6950	.5311	+1.1884	-9.4562	.9815	
6	30 Aquarii	5½	-12	-90	22 28.6	-6 21 53	-0.9298	.5242	+2.240	-9.0972	.9965	
7	α Aquarii	5	+84	-4	16 6.6	+10 44 25	+0.6786	.5145	+2.226	-8.9347	.9984	
8	π Piscium	4½	+90	+4	18 8.2	-11 58 53	+0.8174	.5061	+2.224	+7.9431	0.0000	
9	19 Piscium	6	+90	+3	4 37.2	-1 47 41	+0.7943	.5047	+2.263	+8.6771	.9996	
9	ω Piscium	4	-46	-84	11 34.6	+4 57 53	-1.3286	.5041	+2.238	+9.0266	.9975	
9	d Piscium	5½	+28	-53	23 4.3	-7 51 41	-0.2412	.5047	+2.182	+9.1113	.9963	
11	η Piscium	6	+13	-66	12 43.4	+4 42 57	-0.5084	.5133	+1.1875	+9.4026	.9867	
11	101 Piscium	6	+88	0	14 58.1	+6 53 43	+0.6613	.5138	+1.1851	+9.3823	.9870	
13	μ Arietis	5½	+48	-23	0 38.9	-8 26 11	+0.1235	.5286	+1.406	+9.5219	.9745	
13	47 Arietis	6	+65	-7	8 19.3	-1 0 7	+0.3907	.5320	+1.286	+9.5364	.9727	
13	α Arietis	5½	+24	-43	8 52.4	-0 28 2	-0.2861	.5325	+1.275	+9.5501	.9708	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log $\sin D$	Log $\cos D$
Dec. 13	ζ Arietis	4 $\frac{1}{2}$	+90	+25	16 27.8	+ 6 56 59	+0.9170	0.5362	+1.144	+9.5450	9.9715
13	τ^1 Arietis	5	+90	+41	19 29.3	+ 9 48 42	+1.1254	.5372	+1.090	+9.5473	.9712
14	δ Pleiadum	4 $\frac{1}{2}$	-32	-67	6 37.5	- 3 24 44	-1.1293	.5425	+0.085	+9.6038	.9618
14	B.A.C. 1155	7	+39	-24	7 5.6	- 2 57 32	-0.0195	.5426	+0.079	+9.5867	.9649
14	δ Pleiadum	5	-12	-67	7 18.8	- 2 44 47	-0.8898	.5427	+0.070	+9.6010	.9623
14	p Pleiadum	7 $\frac{1}{2}$	-23	-67	7 47.3	- 2 17 14	-1.0373	.5428	+0.064	+9.6040	.9618
14	γ Tauri	3 $\frac{1}{2}$	-22	-67	7 51.1	- 2 13 34	-1.0200	.5427	+0.063	+9.6038	.9618
14	δ Pleiadum	7	+27	-36	8 16.3	- 1 49 7	-0.2286	.5430	+0.068	+9.5918	.9640
14	ϵ Pleiadum	7 $\frac{1}{2}$	-11	-67	8 32.5	- 1 33 31	-0.8754	.5430	+0.081	+9.6024	.9621
14	f Pleiadum	4 $\frac{1}{2}$	-13	-67	8 38.3	- 1 27 49	-0.9003	.5430	+0.049	+9.6030	.9620
14	λ Pleiadum	5 $\frac{1}{2}$	-20	-66	8 38.9	- 1 27 17	-0.9908	.5430	+0.049	+9.6044	.9617
14	34 Pleiadum	7 $\frac{1}{2}$	+12	-52	8 54.7	- 1 12 4	-0.5003	.5432	+0.040	+9.5970	.9631
14	B.A.C. 1189	7	+90	+44	9 2.3	- 1 4 41	+1.1345	.5433	+0.037	+9.5703	.9677
14	40 Pleiadum	7 $\frac{1}{2}$	- 2	-66	9 26.5	- 0 41 15	-0.7350	.5434	+0.030	+9.6014	.9623
14	32 Tauri	6	+90	+43	12 16.5	+ 2 3 12	+1.1133	.5446	+0.070	+9.5750	.9669
14	33 Tauri	6	+62	+ 3	12 21.3	+ 2 7 45	+0.3509	.5446	+0.077	+9.5878	.9647
15	103 Tauri	6	+61	+ 2	20 51.1	+ 9 32 8	+0.3275	.5541	+0.009	+9.6107	.9605
16	121 Tauri	6	+68	+ 6	9 10.5	- 2 33 47	+0.4169	.5555	-0.013	+9.6084	.9609
16	132 Tauri	5 $\frac{1}{2}$	+18	-40	15 15.3	+ 3 18 34	-0.3650	.5560	-0.018	+9.6180	.9589
16	1 Geminor.	5	+90	+20	22 5.0	+ 9 54 11	+0.7359	.5559	-0.046	+9.5966	.9632
17	μ Geminor.	3	+90	+36	6 35.0	- 5 53 21	+1.0039	.5551	-0.068	+9.5843	.9654
17	δ Geminor.	6	+90	+11	19 32.7	+ 6 37 49	+0.6598	.5531	-0.032	+9.5721	.9674
18	δ Geminor.	3 $\frac{1}{2}$	-22	-68	8 35.3	- 4 46 0	-1.0337	.5499	-0.194	+9.5779	.9664
18	56 Geminor.	5 $\frac{1}{2}$	+75	0	9 28.4	- 3 54 43	+0.5187	.5497	-0.121	+9.5483	.9710
18	63 Geminor.	5 $\frac{1}{2}$	-13	-68	12 6.7	- 1 21 42	-0.9145	.5490	-0.128	+9.5684	.9680
18	g Geminor.	5 $\frac{1}{2}$	+90	+31	20 42.1	+ 6 56 30	+1.0479	.5465	-0.141	+9.5091	.9761
19	ζ Cancri	4 $\frac{1}{2}$	+42	-20	8 55.6	- 5 14 7	+0.0278	.5428	-0.162	+9.4913	.9781
21	ϵ Leonis	3 $\frac{1}{2}$	+29	-49	3 57.1	-11 35 5	-0.2024	.5311	-0.217	+9.2613	.9926
21	π Leonis	5	+21	-59	13 20.4	- 2 29 21	-0.3636	.5297	-0.247	+9.1799	.9950
21	16 Sextantis	6	+78	- 9	17 49.0	+ 1 50 52	+0.5769	.5293	-0.221	+9.0762	.9969
22	36 Sextantis	6	+54	-27	11 34.0	- 4 57 15	+0.2386	.5292	-0.237	+8.7483	.9993
22	B.A.C. 3726	6	+90	+10	15 3.2	- 1 34 33	+0.9230	.5293	-0.237	+8.4884	.9998
22	55 Leonis	6	+90	+ 3	16 45.5	+ 0 4 35	+0.8128	.5295	-0.231	+8.4115	.9998
22	p^1 Leonis	6	+83	- 7	20 38.9	+ 3 50 38	+0.6396	.5308	-0.240	+8.1152	0.0000
23	p^2 Leonis	5	+14	-70	1 37.0	+ 7 39 28	-0.4919	.5309	-0.240	+8.0778	0.0000
23	ϵ Leonis	5	+79	- 9	9 40.3	- 7 32 28	+0.5909	.5330	-0.241	-8.5929	9.9997
23	B.A.C. 4006	6	+77	-10	19 39.0	+ 2 7 7	+0.5809	.5348	-0.231	-8.9010	.9986
25	75 Virginis	6	+54	-22	18 3.7	- 1 2 3	+0.3356	.5635	-0.208	-9.4030	.9856
27	42 Libræ	5 $\frac{1}{2}$	+67	+10	21 21.2	+ 0 17 12	+0.8664	.6008	-0.104	-9.5984	.9628
28	δ Scorpii	2 $\frac{1}{2}$	-33	-90	4 57.5	+ 7 34 47	-0.9725	.6050	-0.082	-0.5778	.9665
28	19 Scorpii	5 $\frac{1}{2}$	+24	-36	12 30.7	- 9 11 1	+0.0781	.6001	-0.056	-9.6065	.9613
28	ϵ Ophiuchi	5	-20	-90	14 21.9	- 7 24 25	-0.7321	.6005	-0.056	-9.5941	.9636
28	22 Scorpii	5	+65	+ 9	16 2.6	- 5 47 59	+0.8468	.6101	-0.013	-9.6228	.9579
28	25 Scorpii	6	+65	+25	22 11.5	+ 0 5 16	+1.0532	.6115	-0.034	-9.6304	.9563
29	B.A.C. 5709	6	+49	-10	3 1.9	+ 4 43 23	+0.5354	.6124	-0.019	-9.6240	.9577
29	26 Ophiuchi	6	+41	-18	3 6.2	+ 4 57 31	+0.4302	.6124	-0.019	-9.6223	.9580
29	39 Ophiuchi	5 $\frac{1}{2}$	+ 1	-57	9 42.3	+11 6 53	-0.2664	.6128	-0.012	-9.6116	.9603
29	δ Ophiuchi	3 $\frac{1}{2}$	+42	-14	11 9.5	-11 29 39	+0.4591	0.6126	+0.003	-9.6236	9.9578

NOTE. — B. A. C., British Association Catalogue.

**OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT
WASHINGTON, D. C., DURING THE YEAR 1861.**

Date.	Star's Name.	Magnitude.	IMMERSSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m			h m	h m			h m
Jan. 1	ρ^{δ} Leonis	5	5 5	10 18	220	169	5 57	11 9	87	37	0 52
6	B.A.C. 5314	6	12 43	17 35	198	162	13 26	18 18	124	94	0 42
15	\times Piscium	4 $\frac{1}{2}$	2 45	7 4	353	37	3 32	7 51	72	120	0 47
19	26 Arietis	6 $\frac{1}{2}$	4 28	8 30	265	312	5 45	9 47	131	185	1 17
24	δ Geminor.	3 $\frac{1}{2}$	10 40	14 22	157	214	Star 0'1	south of	C's limb.		
Feb. 24	63 Geminor.	5 $\frac{1}{2}$	13 35	17 16	228	290	14 22	18 3	94	142	0 47
2	B.A.C. 5197	6	13 10	16 15	339	310	Star 1'1	north of	C's limb.		
5	B.A.C. 6369†	6	13 12	16 6	292	242	14 12	17 5	69	24	1 0
17	40 Pleiadum	7 $\frac{1}{2}$	3 42	5 51	225	225	4 30	6 39	163	194	0 48
17	36 Tauri†	6 $\frac{1}{2}$	11 16	13 13	211	258	11 42	13 50	150	194	0 26
20	B.A.C. 2238	6	10 33	12 29	276	335	11 30	13 26	45	103	0 57
21	85 Geminor.	6 $\frac{1}{2}$	13 28	15 19	279	333	14 13	16 5	38	89	0 45
22	54 Cancri	6 $\frac{1}{2}$	13 0	14 48	245	300	13 58	15 46	60	113	0 58
Mar. 2	α Scorpii	1 $\frac{1}{2}$	14 10	15 25	207	180	15 1	16 16	125	108	0 51
4	δ Sagittarii†	3	13 24	14 32	301	253	14 20	15 28	56	13	0 56
16	9 Tauri	6	7 12	7 34	238	295	8 11	8 32	131	189	0 58
20	δ Geminor.	3 $\frac{1}{2}$	9 1	9 7	228	276	10 13	10 19	86	142	1 12
20	63 Geminor.	5 $\frac{1}{2}$	12 57	13 2	274	328	13 46	13 52	47	98	0 50
21	δ^{δ} Cancri	6	14 33	14 34	203	255	15 10	15 11	112	161	0 37
29	B.A.C. 5286†	6 $\frac{1}{2}$	10 58	10 28	276	228	11 53	11 23	47	5	0 55
April 15	5 Geminor.	6	12 37	11 0	320	12	13 1	11 24	15	64	0 24
17	B.A.C. 2683†	6	14 46	13 1	314	3	15 8	13 23	6	54	0 22
18	54 Cancri	6 $\frac{1}{2}$	11 10	9 21	302	349	11 43	9 54	358	48	0 33
20	36 Sextantis†	6	16 21	14 24	220	271	17 10	15 13	89	139	0 49
May 12	Mars		10 53	7 30	257	313	11 55	8 32	78	130	1 2
23	B.A.C. 5286	6 $\frac{1}{2}$	11 28	7 22	244	199	12 30	8 24	80	42	1 2
25	B.A.C. 6217	6 $\frac{1}{2}$	19 7	14 52	12	23	Star 1'6	north of	C's limb.		
27	α Capricor.	5 $\frac{1}{2}$	19 8	14 45	240	226	19 56	15 32	171	168	0 48
31	B.A.C. 8152*	6 $\frac{1}{2}$	16 16	11 37	283	233	17 11	12 32	125	74	0 56
June 13	16 Sextantis*	6	16 40	11 10	194	244	17 12	11 42	117	166	0 32
14	55 Leonis	6	15 20	9 47	150	199	Star 0'9	south of	C's limb.		
15	B.A.C. 4006†	6	17 2	11 24	284	334	17 46	12 8	28	79	0 44
2	47 Arietist†	6	19 18	12 33	263	217	20 5	13 20	135	85	0 47
17	α Scorpii	3 $\frac{1}{2}$	18 32	10 48	282	309	19 43	11 59	78	116	1 12
19	B.A.C. 6217	6 $\frac{1}{2}$	16 19	8 28	4	340	Star 1'5	north of	C's limb.		
21	α Capricor.	5 $\frac{1}{2}$	16 53	8 54	230	192	17 34	9 35	165	134	0 41
21	π Capricor.	5	22 8	14 8	243	266	22 48	14 48	176	206	0 40
21	ϵ Capricor.	5	23 5	15 5	286	319	0 11	16 11	131	174	1 6
21	B.A.C. 7073	6 $\frac{1}{2}$	0 5	16 5	28	70	Star 0'0	north of	C's limb.		
25	16 Piscium	6	19 47	11 31	319	274	20 58	12 42	107	69	1 11
26	45 Piscium	6	23 18	14 58	246	225	23 59	15 39	189	182	0 42
29	α Arietis	5 $\frac{1}{2}$	21 31	12 59	311	256	22 33	14 2	98	43	1 3
30	9 Tauri	6	0 30	15 54	8	311	0 48	16 12	36	339	0 18
Aug. 13	B.A.C. 5286	6 $\frac{1}{2}$	16 41	7 11	298	309	17 46	8 16	46	69	1 6
24	101 Piscium	6	21 17	11 3	299	246	22 29	12 15	122	73	1 12
Sept. 10	25 Scorpii	6	19 38	8 17	320	354	20 25	9 5	45	86	0 48
22	47 Arietis	6	23 57	11 48	287	234	1 18	13 10	124	82	1 22
23	B.A.C. 1155	7	23 19	11 7	20	322	Star 4'7	north of	C's limb.		
Oct. 9	24 Sagittarii†	6	22 7	8 52	289	330	23 10	9 56	106	153	1 4
10	50 Sagittarii	6	18 50	5 32	321	315	20 3	6 45	78	88	1 12
10	B.A.C. 6671	6	21 53	8 34	328	358	22 52	9 34	79	118	0 59
11	B.A.C. 7043	6 $\frac{1}{2}$	0 6	10 43	263	304	0 59	11 36	151	198	0 53
15	16 Piscium	6	23 33	9 54	272	273	0 43	11 5	161	183	1 10

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1861.

		Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
Date.	Star's Name.		Washington.		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m			h m	h m			h m
Oct.	16 45 Piscium	6	3 52	14 9	207	254	Star 0.7	south of	C's	limb.	
	19 B.A.C. 782	6½	19 44	5 50	321	271	20 33	6 39	82	30	0 48
	22 103 Tauri†	6	21 17	7 12	346	302	21 36	7 30	29	343	0 19
	23 1 Geminor.	5	22 51	8 41	183	134	Star 3.0	south of	C's	limb.	
	23 2 Geminor.	6½	23 33	9 23	283	232	0 32	10 22	84	28	0 59
Nov.	27 o Leonis	3½	3 35	13 9	285	233	4 25	13 58	36	343	0 50
	10 * Aquarii	5	0 22	9 1	297	325	1 39	10 18	131	172	1 17
	14 101 Piscium	6	22 36	7 0	313	264	23 55	8 18	111	76	1 19
	18 103 Tauri	6	6 25	14 31	257	302	7 50	15 57	93	150	1 25
	19 2 Geminor.	6½	9 55	17 57	396	4	10 37	18 40	25	82	0 43
Dec.	3 B.A.C. 6343‡	6	22 15	5 24	294	335	23 15	6 25	100	149	1 0
	5 B.A.C. 7097	6	21 54	4 55	298	317	23 8	6 9	121	155	1 14
	5 B.A.C. 7145	6½	1 8	8 8	218	264	1 19	8 20	197	244	0 11
	13 47 Arietis	6	0 33	7 2	300	250	1 59	8 28	109	82	1 26
	14 33 Tauri	6	6 21	12 46	260	315	7 39	14 4	105	163	1 18
	16 121 Tauri	6	1 7	7 24	267	210	2 19	8 36	106	49	1 12
	18 56 Geminor.	5½	1 31	7 40	230	176	2 23	8 33	118	62	0 53
	22 36 Sextantis†	6	3 44	9 37	256	206	4 38	10 31	60	8	0 54
	22 55 Leonis	6	10 41	16 33	98	97	11 46	17 39	89	106	1 6

NOTES.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

The *Angles of Position*, for the points of contact, are for *direct vision*, and are reckoned from the Moon's *North Point* and from its *Vertex* towards the West. For *inverted image*, add 180° to the angles given.

436 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JANUARY.

		d	h	m	s			d	h	m	s
I. Shadow	Ingress	1	7	18		I. Transit	Egress W.	8	12	18	
I. Transit	Ingress	1	8	11		III. Shadow	Ingress	9	4	38	
I. Shadow	Egress W.	1	9	38		II. Shadow	Ingress	9	5	47	
I. Transit	Egress W.	1	10	31		I. Eclipse	Disapp.	9	6	29	4.7
III. Shadow	Ingress	2	0	40		II. Transit	Ingress	9	7	17	
II. Shadow	Ingress	2	3	14		III. Transit	Ingress	9	7	35	
III. Transit	Ingress	2	4	9		III. Shadow	Egress	9	8	21	
III. Shadow	Egress	2	4	23		II. Shadow	Egress W.	9	8	43	
I. Eclipse	Disapp.	2	4	35	49.4	I. Occult.	Reapp. W.	9	9	31	
II. Transit	Ingress	2	5	0		II. Transit	Egress W.	9	10	13	
II. Shadow	Egress	2	6	10		III. Transit	Egress W.	9	11	17	
I. Occult.	Reapp.	2	7	45		I. Shadow	Ingress	10	3	41	
III. Transit	Egress	2	7	51		I. Transit	Ingress	10	4	24	
II. Transit	Egress	2	7	56		I. Shadow	Egress	10	6	1	
I. Shadow	Ingress	3	1	47		I. Transit	Egress	10	6	44	
I. Transit	Ingress	3	2	38		II. Eclipse	Disapp.	11	0	27	27.8
I. Shadow	Egress	3	4	7		I. Eclipse	Disapp.	11	0	57	35.3
I. Transit	Egress	3	4	58		I. Occult.	Reapp.	11	3	57	
IV. Eclipse	Disapp. W.	3	14	58	50.9	II. Occult.	Reapp.	11	4	48	
IV. Eclipse	Reapp.	3	19	45	21.3	I. Shadow	Ingress	11	22	9	
II. Eclipse	Disapp.	3	21	51	9.6	IV. Shadow	Ingress	11	22	20	
IV. Occult.	Disapp.	3	22	51		I. Transit	Ingress	11	22	50	
I. Eclipse	Disapp.	3	23	4	8.0	I. Shadow	Egress	12	0	29	
I. Occult.	Reapp.	4	2	11		I. Transit	Egress	12	1	10	
II. Occult.	Reapp.	4	2	28		IV. Shadow	Egress	12	3	16	
IV. Occult.	Reapp.	4	3	42		IV. Transit	Ingress	12	4	40	
I. Shadow	Ingress	4	20	16		IV. Transit	Egress W.	12	9	31	
I. Transit	Ingress	4	21	5		III. Eclipse	Disapp.	12	18	52	7.1
I. Shadow	Egress	4	22	35		II. Shadow	Ingress	12	19	4	
I. Transit	Egress	4	23	25		I. Eclipse	Disapp.	12	19	25	44.9
III. Eclipse	Disapp. W.	5	14	54	18.3	II. Transit	Ingress	12	20	24	
II. Shadow	Ingress W.	5	16	31		II. Shadow	Egress	12	22	0	
I. Eclipse	Disapp. W.	5	17	32	26.2	I. Occult.	Reapp.	12	22	23	
II. Transit	Ingress W.	5	18	8		II. Transit	Egress	12	23	21	
II. Shadow	Egress	5	19	27		III. Occult.	Reapp.	13	1	10	
I. Occult.	Reapp.	5	20	38		I. Shadow	Ingress W.	13	16	38	
II. Transit	Egress	5	21	4		I. Transit	Ingress W.	13	17	17	
III. Occult.	Reapp.	5	21	46		I. Shadow	Egress	13	18	58	
I. Shadow	Ingress W.	6	14	44		I. Transit	Egress	13	19	37	
I. Transit	Ingress W.	6	15	31		II. Eclipse	Disapp. W.	14	13	45	6.3
I. Shadow	Egress W.	6	17	4		I. Eclipse	Disapp. W.	14	13	54	4.9
I. Transit	Egress W.	6	17	51		I. Occult.	Reapp. W.	14	16	49	
II. Eclipse	Disapp. W.	7	11	8	44.0	II. Occult.	Reapp. W.	14	17	57	
I. Eclipse	Disapp. W.	7	12	0	44.5	I. Shadow	Ingress W.	15	11	6	
I. Occult.	Reapp. W.	7	15	4		I. Transit	Ingress W.	15	11	43	
II. Occult.	Reapp. W.	7	15	38		I. Shadow	Egress W.	15	13	26	
I. Shadow	Ingress W.	8	9	13		I. Transit	Egress W.	15	14	3	
I. Transit	Ingress W.	8	9	58		II. Shadow	Ingress W.	16	8	20	
I. Shadow	Egress W.	8	11	32		I. Eclipse	Disapp. W.	16	8	22	26.6

JUPITER'S SATELLITES, 1861. 437

WASHINGTON MEAN TIME.

JANUARY.

				d	h	m	s					d	h	m	s
III.	Shadow	Ingress	W.	16	8	36		II.	Transit	Egress	W.	23	14	42	
II.	Transit	Ingress	W.	16	9	32		III.	Shadow	Egress	W.	23	16	18	
III.	Transit	Ingress	W.	16	10	57		III.	Transit	Egress	W.	23	18	0	
I.	Occult.	Reapp.	W.	16	11	15		I.	Shadow	Ingress	W.	24	7	29	
II.	Shadow	Egress	W.	16	11	17		I.	Transit	Ingress	W.	24	7	53	
III.	Shadow	Egress	W.	16	12	19		I.	Shadow	Egress	W.	24	9	49	
II.	Transit	Egress	W.	16	12	29		I.	Transit	Egress	W.	24	10	13	
III.	Transit	Egress	W.	16	14	40		I.	Eclipse	Disapp.		25	4	44	18.7
I.	Shadow	Ingress		17	5	35		II.	Eclipse	Disapp.		25	5	40	26.6
I.	Transit	Ingress		17	6	9		I.	Occult.	Reapp.	W.	25	7	25	
I.	Shadow	Egress		17	7	55		II.	Occult.	Reapp.	W.	25	9	22	
I.	Transit	Egress	W.	17	8	29		I.	Shadow	Ingress		26	1	57	
I.	Eclipse	Disapp.		18	2	50	48.9	I.	Transit	Ingress		26	2	19	
II.	Eclipse	Disapp.		18	3	3	53.7	I.	Shadow	Egress		26	4	17	
I.	Occult.	Reapp.		18	5	41		I.	Transit	Egress		26	4	39	
II.	Occult.	Reapp.		18	7	6		I.	Eclipse	Disapp.		26	23	12	41.3
I.	Shadow	Ingress		19	0	3		II.	Shadow	Ingress		27	0	11	
I.	Transit	Ingress		19	0	35		II.	Transit	Ingress		27	0	52	
I.	Shadow	Egress		19	2	23		I.	Occult.	Reapp.		27	1	51	
I.	Transit	Egress		19	2	55		III.	Eclipse	Disapp.		27	2	47	36.6
I.	Eclipse	Disapp.		19	21	19	9.9	II.	Shadow	Egress		27	3	7	
II.	Shadow	Ingress		19	21	37		II.	Transit	Egress		27	3	49	
II.	Transit	Ingress		19	22	39		III.	Occult.	Reapp.	W.	27	7	48	
III.	Eclipse	Disapp.		19	22	49	46.3	I.	Shadow	Ingress		27	20	26	
I.	Occult.	Reapp.		20	0	7		I.	Transit	Ingress		27	20	45	
II.	Shadow	Egress		20	0	34		I.	Shadow	Egress		27	22	46	
II.	Transit	Egress		20	1	35		I.	Transit	Egress		27	23	5	
III.	Occult.	Reapp.		20	4	30		IV.	Shadow	Ingress	W.	28	16	18	
IV.	Eclipse	Disapp.	W.	20	8	58	36.2	I.	Eclipse	Disapp.	W.	28	17	41	4.9
IV.	Occult.	Reapp.		20	18	28		II.	Eclipse	Disapp.		28	18	58	12.1
I.	Shadow	Ingress		20	18	32		IV.	Transit	Ingress		28	19	7	
I.	Transit	Ingress		20	19	1		I.	Occult.	Reapp.		28	20	17	
I.	Shadow	Egress		20	20	52		IV.	Shadow	Egress		28	21	14	
I.	Transit	Egress		20	21	21		II.	Occult.	Reapp.		28	22	30	
I.	Eclipse	Disapp.	W.	21	15	47	31.5	IV.	Transit	Egress		28	23	59	
II.	Eclipse	Disapp.	W.	21	16	21	35.8	I.	Shadow	Ingress	W.	29	14	54	
I.	Occult.	Reapp.		21	18	33		I.	Transit	Ingress	W.	29	15	11	
II.	Occult.	Reapp.		21	20	14		I.	Shadow	Egress	W.	29	17	14	
I.	Shadow	Ingress	W.	22	13	0		I.	Transit	Egress	W.	29	17	31	
I.	Transit	Ingress	W.	22	13	27		I.	Eclipse	Disapp.	W.	30	12	9	29.7
I.	Shadow	Egress	W.	22	15	20		II.	Shadow	Ingress	W.	30	13	28	
I.	Transit	Egress	W.	22	15	47		II.	Transit	Ingress	W.	30	14	0	
I.	Eclipse	Disapp.	W.	23	10	15	54.5	I.	Occult.	Reapp.	W.	30	14	43	
II.	Shadow	Ingress	W.	23	10	53		II.	Shadow	Egress	W.	30	16	24	
II.	Transit	Ingress	W.	23	11	46		III.	Shadow	Ingress	W.	30	16	33	
III.	Shadow	Ingress	W.	23	12	34		II.	Transit	Egress	W.	30	16	56	
I.	Occult.	Reapp.	W.	23	12	59		III.	Transit	Ingress	W.	30	17	36	
II.	Shadow	Egress	W.	23	13	50		III.	Shadow	Egress		30	20	17	
III.	Transit	Ingress	W.	23	14	18		III.	Transit	Egress		30	21	17	

438 JUPITER'S SATELLITES, 1861.

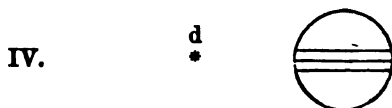
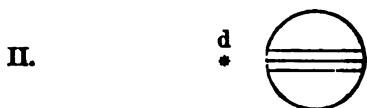
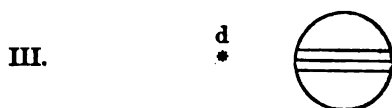
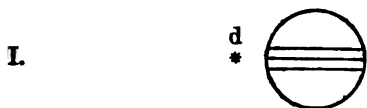
WASHINGTON MEAN TIME.

JANUARY.

I. Shadow Ingress W. ^{d h m} 31 9 23
I. Transit Ingress W. 31 9 37

I. Shadow Egress W. ^{d h m} 31 11 43
I. Transit Egress W. 31 11 57

Phases of the Eclipses of the Satellites for an Inverting Telescope.



FEBRUARY.

I. Eclipse Disapp. ^{d h m s} 1 6 37 55.8
II. Eclipse Disapp. W. 1 8 17 5.5
I. Occult. Reapp. W. 1 9 8
II. Occult. Reapp. W. 1 11 38
I. Shadow Ingress 2 3 52
I. Transit Ingress 2 4 3
I. Shadow Egress 2 6 12
I. Transit Egress 2 6 23
I. Eclipse Disapp. 3 1 6 20.9
II. Shadow Ingress 3 2 44
II. Transit Ingress 3 3 5
I. Occult. Reapp. 3 3 34
II. Shadow Egress 3 5 41
II. Transit Egress 3 6 1
III. Eclipse Disapp. W. 3 6 46 3.3
III. Occult. Reapp. W. 3 11 4
I. Shadow Ingress 3 22 20
I. Transit Ingress 3 22 29
I. Shadow Egress 4 0 40
I. Transit Egress 4 0 49
I. Eclipse Disapp. 4 19 34 45.7
II. Eclipse Disapp. 4 21 34 55.0
I. Occult. Reapp. 4 22 0
II. Occult. Reapp. 5 0 45
I. Shadow Ingress W. 5 16 49
I. Transit Ingress W. 5 16 55
I. Shadow Egress 5 19 9

I. Transit Egress ^{d h m s} 5 19 15
IV. Eclipse Disapp. 6 2 58 32.3
IV. Occult. Reapp. W. 6 8 41
I. Eclipse Disapp. W. 6 14 3 12 0
II. Shadow Ingress W. 6 16 1
II. Transit Ingress W. 6 16 11
I. Occult. Reapp. W. 6 16 26
II. Shadow Egress 6 18 58
II. Transit Egress 6 19 7
III. Shadow Ingress 6 20 32
III. Transit Ingress 6 20 52
III. Shadow Egress 7 0 15
III. Transit Egress 7 0 33
I. Shadow Ingress W. 7 11 17
I. Transit Ingress W. 7 11 21
I. Shadow Egress W. 7 13 37
I. Transit Egress W. 7 13 41
I. Eclipse Disapp. W. 8 8 31 40.4
I. Occult. Reapp. W. 8 10 51
II. Eclipse Disapp. W. 8 10 53 50.0
II. Occult. Reapp. W. 8 13 53
I. Shadow Ingress 9 5 46
I. Transit Ingress 9 5 47
I. Shadow Egress W. 9 8 6
I. Transit Egress W. 9 8 7
I. Occult. Disapp. 10 2 57
II. Transit Ingress 10 5 17

JUPITER'S SATELLITES, 1861. 439

WASHINGTON MEAN TIME.

FEBRUARY.

			d	h	m	s				d	h	m	s
II.	Shadow	Ingress	10	5	18		II.	Shadow	Egress W.	17	10	49	
I.	Occult.	Reapp.	10	5	17		III.	Occult.	Disapp. W.	17	13	53	
II.	Transit	Egress W.	10	8	14		III.	Eclipse	Reapp.	17	18	16	55.0
II.	Shadow	Egress W.	10	8	15		I.	Transit	Ingress	18	1	58	
III.	Occult.	Disapp. W.	10	10	37		I.	Shadow	Ingress	18	2	9	
III.	Occult.	Reapp. W.	10	14	19		I.	Transit	Egress	18	4	18	
I.	Transit	Ingress	11	0	13		I.	Shadow	Egress	18	4	29	
I.	Shadow	Ingress	11	0	15		I.	Occult.	Disapp.	18	23	7	
I.	Transit	Egress	11	2	34		I.	Eclipse	Reapp.	19	1	37	40.4
I.	Shadow	Egress	11	2	35		II.	Occult.	Disapp.	19	2	19	
I.	Occult.	Disapp.	11	21	23		II.	Eclipse	Reapp.	19	5	41	38.0
I.	Occult.	Reapp.	11	23	43		I.	Transit	Ingress	19	20	24	
II.	Occult.	Disapp.	12	0	4		I.	Shadow	Ingress	19	20	37	
II.	Eclipse	Reapp.	12	3	4	50.1	I.	Transit	Egress	19	22	44	
I.	Transit	Ingress	12	18	39		I.	Shadow	Egress	19	22	57	
I.	Shadow	Ingress	12	18	43		I.	Occult.	Disapp. W.	20	17	33	
I.	Transit	Egress	12	21	0		I.	Eclipse	Reapp.	20	20	6	10.5
I.	Shadow	Egress	12	21	3		II.	Transit	Ingress	20	20	36	
I.	Occult.	Disapp. W.	13	15	49		II.	Shadow	Ingress	20	21	9	
I.	Eclipse	Reapp.	13	18	12	10.7	II.	Transit	Egress	20	23	33	
II.	Transit	Ingress	13	18	24		II.	Shadow	Egress	21	0	6	
II.	Shadow	Ingress	13	18	35		III.	Transit	Ingress	21	3	23	
II.	Transit	Egress	13	21	21		III.	Shadow	Ingress	21	4	30	
II.	Shadow	Egress	13	21	32		III.	Transit	Egress W.	21	7	5	
III.	Transit	Ingress	14	0	7		III.	Shadow	Egress W.	21	8	12	
III.	Shadow	Ingress	14	0	31		I.	Transit	Ingress W.	21	14	50	
III.	Transit	Egress	14	3	49		I.	Shadow	Ingress W.	21	15	6	
III.	Shadow	Egress	14	4	14		I.	Transit	Egress W.	21	17	10	
IV.	Transit	Ingress W.	14	9	16		I.	Shadow	Egress W.	21	17	26	
IV.	Shadow	Ingress W.	14	10	18		I.	Occult.	Disapp. W.	22	11	59	
I.	Transit	Ingress W.	14	13	5		I.	Eclipse	Reapp. W.	22	14	34	43.9
I.	Shadow	Ingress W.	14	13	12		II.	Occult.	Disapp. W.	22	15	27	
IV.	Transit	Egress W.	14	14	8		IV.	Occult.	Disapp.	22	17	55	
IV.	Shadow	Egress W.	14	15	13		II.	Eclipse	Reapp.	22	19	0	32.6
I.	Transit	Egress W.	14	15	26		IV.	Eclipse	Reapp.	23	1	44	1.3
I.	Shadow	Egress W.	14	15	33		I.	Transit	Ingress W.	23	9	16	
I.	Occult.	Disapp. W.	15	10	15		I.	Shadow	Ingress W.	23	9	35	
I.	Eclipse	Reapp. W.	15	12	40	41.6	I.	Transit	Egress W.	23	11	36	
II.	Occult.	Disapp. W.	15	13	12		I.	Shadow	Egress W.	23	11	55	
II.	Eclipse	Reapp. W.	15	16	23	44.6	I.	Occult.	Disapp. W.	24	6	25	
I.	Transit	Ingress W.	16	7	31		I.	Eclipse	Reapp. W.	24	9	3	14.3
I.	Shadow	Ingress W.	16	7	40		II.	Transit	Ingress W.	24	9	43	
I.	Transit	Egress W.	16	9	52		II.	Shadow	Ingress W.	24	10	27	
I.	Shadow	Egress W.	16	10	0		II.	Transit	Egress W.	24	12	40	
I.	Occult.	Disapp.	17	4	31		II.	Shadow	Egress W.	24	13	24	
I.	Eclipse	Reapp. W.	17	7	9	10.2	III.	Occult.	Disapp. W.	24	17	10	
II.	Transit	Ingress W.	17	7	30		III.	Eclipse	Reapp.	24	22	15	24.5
II.	Shadow	Ingress W.	17	7	52		I.	Transit	Ingress	25	3	42	
II.	Transit	Egress W.	17	10	26		I.	Shadow	Ingress	25	4	3	

440 JUPITER'S SATELLITES, 1861.

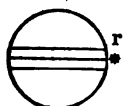
WASHINGTON MEAN TIME.

FEBRUARY.

I. Transit	Egress W.	d h m s	25 6 2	II. Transit	Ingress	d h m	27 22 50
I. Shadow	Egress W.	25 6 23		II. Shadow	Ingress	27 23 44	
I. Occult.	Disapp.	26 0 51		II. Transit	Egress	28 1 47	
I. Eclipse	Reapp.	26 3 31 46.6		II. Shadow	Egress	28 2 40	
II. Occult.	Disapp.	26 4 35		III. Transit	Ingress W.	28 6 41	
II. Eclipse	Reapp. W.	26 8 18 28.1		III. Shadow	Ingress W.	28 8 29	
I. Transit	Ingress	26 22 9		III. Transit	Egress W.	28 10 25	
I. Shadow	Ingress	26 22 32		III. Shadow	Egress W.	28 12 12	
I. Transit	Egress	27 0 29		I. Transit	Ingress W.	28 16 35	
I. Shadow	Egress	27 0 52		I. Shadow	Ingress W.	28 17 0	
I. Occult.	Disapp.	27 19 17		I. Transit	Egress	28 18 55	
I. Eclipse	Reapp.	27 22 0 18.8		I. Shadow	Egress	28 19 20	

Phases of the Eclipses of the Satellites for an Inverting Telescope.

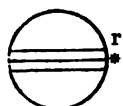
I.



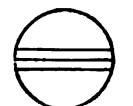
III.



II.



IV.



MARCH.

I. Occult.	Disapp. W.	d h m s	1 13 43	II. Shadow	Egress W.	d h m s	3 15 57
I. Eclipse	Reapp. W.	1 16 28 54.2		III. Occult.	Disapp.	3 20 29	
II. Occult.	Disapp.	1 17 44		III. Eclipse	Reapp.	4 2 13 56.5	
II. Eclipse	Reapp. W.	1 21 37 22.3		I. Transit	Ingress	4 5 28	
I. Transit	Ingress W.	2 11 1		I. Shadow	Ingress	4 5 58	
I. Shadow	Ingress W.	2 11 29		I. Transit	Egress W.	4 7 47	
I. Transit	Egress W.	2 13 21		I. Shadow	Egress W.	4 8 18	
I. Shadow	Egress W.	2 13 49		I. Occult.	Disapp.	5 2 35	
IV. Transit	Ingress	2 23 32		I. Eclipse	Reapp.	5 5 26 1.1	
IV. Shadow	Ingress	3 4 18		II. Occult.	Disapp. W.	5 6 52	
IV. Transit	Egress	3 4 26		II. Eclipse	Reapp. W.	5 10 53 19.9	
I. Occult.	Disapp. W.	3 8 9		I. Transit	Ingress	5 23 54	
IV. Shadow	Egress W.	3 9 12		I. Shadow	Ingress	6 0 27	
I. Eclipse	Reapp. W.	3 10 57 26.6		I. Transit	Egress	6 2 13	
II. Transit	Ingress W.	3 11 58		I. Shadow	Egress	6 2 47	
II. Shadow	Ingress W.	3 13 0		I. Occult.	Disapp.	6 21 2	
II. Transit	Egress W.	3 14 54		I. Eclipse	Reapp.	6 23 54 35.0	

JUPITER'S SATELLITES, 1861. 441

WASHINGTON MEAN TIME.

MARCH.

		d	h	m	s			d	h	m	s
II.	Transit	Ingress	7	1	6	II.	Shadow	Egress	W.	14	7 56
II.	Shadow	Ingress	7	2	19	III.	Transit	Ingress	W.	14	13 27
II.	Transit	Egress	7	4	2	III.	Shadow	Ingress		14	16 28
II.	Shadow	Egress	7	5	15	III.	Transit	Egress		14	17 9
III.	Transit	Ingress	W.	7	10 2	I.	Transit	Ingress		14	20 6
III.	Shadow	Ingress	W.	7	12 23	III.	Shadow	Egress		14	20 10
III.	Transit	Egress	W.	7	13 45	I.	Shadow	Ingress		14	20 50
III.	Shadow	Egress	W.	7	16 11	I.	Transit	Egress		14	22 25
I.	Transit	Ingress		7	18 20	I.	Shadow	Egress		14	23 10
I.	Shadow	Ingress		7	18 55	I.	Occult.	Disapp.		15	17 14
I.	Transit	Egress		7	20 39	I.	Eclipse	Reapp.		15	20 17 38.9
I.	Shadow	Egress		7	21 15	II.	Occult.	Disapp.		15	22 23
I.	Occult.	Disapp.	W.	8	15 28	II.	Eclipse	Reapp.		16	2 51 2.0
I.	Eclipse	Reapp.		8	18 23 12.7	I.	Transit	Ingress	W.	16	14 33
II.	Occult.	Disapp.		8	20 2	I.	Shadow	Ingress	W.	16	15 19
II.	Eclipse	Reapp.		9	0 14 12.6	I.	Transit	Egress		16	16 52
I.	Transit	Ingress	W.	9	12 47	I.	Shadow	Egress		16	17 39
I.	Shadow	Ingress	W.	9	13 24	I.	Occult.	Disapp.	W.	17	11 40
I.	Transit	Egress	W.	9	15 6	I.	Eclipse	Reapp.	W.	17	14 46 15.3
I.	Shadow	Egress	W.	9	15 44	II.	Transit	Ingress		17	16 32
I.	Occult.	Disapp.	W.	10	9 54	II.	Shadow	Ingress		17	18 11
I.	Eclipse	Reapp.	W.	10	12 51 47.1	II.	Transit	Egress		17	19 29
II.	Transit	Ingress	W.	10	14 14	II.	Shadow	Egress		17	21 7
II.	Shadow	Ingress	W.	10	15 36	III.	Occult.	Disapp.		18	3 16
II.	Transit	Egress		10	17 10	I.	Transit	Ingress	W.	18	8 59
II.	Shadow	Egress		10	18 32	I.	Shadow	Ingress	W.	18	9 47
III.	Occult.	Disapp.		10	23 51	III.	Eclipse	Reapp.	W.	18	10 10 57.6
III.	Eclipse	Reapp.		11	6 12 21.5	I.	Transit	Egress	W.	18	11 19
I.	Transit	Ingress	W.	11	7 13	I.	Shadow	Egress	W.	18	12 7
I.	Shadow	Ingress	W.	11	7 52	I.	Occult.	Disapp.		19	6 7
IV.	Occult.	Disapp.	W.	11	8 24	I.	Eclipse	Reapp.	W.	19	9 14 53.8
I.	Transit	Egress	W.	11	9 32	II.	Occult.	Disapp.	W.	19	11 32
I.	Shadow	Egress	W.	11	10 12	IV.	Transit	Ingress	W.	19	14 22
IV.	Occult.	Reapp.	W.	11	13 19	II.	Eclipse	Reapp.		19	16 9 1.8
IV.	Eclipse	Disapp.	W.	11	15 0 56.6	IV.	Transit	Egress		19	19 17
IV.	Eclipse	Reapp.		11	19 44 39.8	IV.	Shadow	Ingress		19	22 18
I.	Occult.	Disapp.		12	4 21	IV.	Shadow	Egress		20	3 12
I.	Eclipse	Reapp.	W.	12	7 20 23.6	I.	Transit	Ingress		20	3 26
II.	Occult.	Disapp.	W.	12	9 11	I.	Shadow	Ingress		20	4 16
II.	Eclipse	Reapp.	W.	12	13 32 11.6	I.	Transit	Egress		20	5 46
I.	Transit	Ingress		13	1 40	I.	Shadow	Egress	W.	20	6 36
I.	Shadow	Ingress		13	2 21	I.	Occult.	Disapp.		21	0 34
I.	Transit	Egress		13	3 59	I.	Eclipse	Reapp.		21	3 43 30.9
I.	Shadow	Egress		13	4 41	II.	Transit	Ingress		21	5 42
I.	Occult.	Disapp.		13	22 47	II.	Shadow	Ingress	W.	21	7 28
I.	Eclipse	Reapp.		14	1 48 59.2	II.	Transit	Egress	W.	21	8 38
II.	Transit	Ingress		14	3 23	II.	Shadow	Egress	W.	21	10 25
II.	Shadow	Ingress		14	4 53	III.	Transit	Ingress		21	16 54
II.	Transit	Egress		14	6 20	III.	Shadow	Ingress		21	20 27

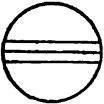
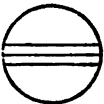
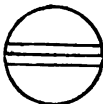
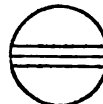
442 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

MARCH.

			^d	^h	^m	^s				^d	^h	^m	^s
III.	Transit	Egress	21	20	37			I.	Shadow	Ingress	27	6	12
I.	Transit	Ingress	21	21	53			I.	Transit	Egress W.	27	7	34
I.	Shadow	Ingress	21	22	45			I.	Shadow	Egress W.	27	8	32
III.	Shadow	Egress	22	0	9			IV.	Occult.	Disapp.	27	23	38
I.	Transit	Egress	22	0	13			I.	Occult.	Disapp.	28	2	23
I.	Shadow	Egress	22	1	5			IV.	Occult.	Reapp.	28	4	33
I.	Occult.	Disapp.	22	19	1			I.	Eclipse	Reapp.	28	5	38 9.0
I.	Eclipse	Reapp.	22	22	12	2.6		II.	Transit	Ingress W.	28	8	3
II.	Occult.	Disapp.	23	0	44			IV.	Eclipse	Disapp. W.	28	9	2 44.3
II.	Eclipse	Reapp.	23	5	27 49.2			II.	Shadow	Ingress W.	28	10	3
I.	Transit	Ingress	23	16	20			II.	Transit	Egress W.	28	11	0
I.	Shadow	Ingress	23	17	14			II.	Shadow	Egress W.	28	13	0
I.	Transit	Egress	23	18	40			IV.	Eclipse	Reapp. W.	28	13	45 2.1
I.	Shadow	Egress	23	19	34			III.	Transit	Ingress	28	20	26
I.	Occult.	Disapp. W.	24	13	28			I.	Transit	Ingress	28	23	41
I.	Eclipse	Reapp.	24	16	40 50.3			III.	Transit	Egress	29	0	8
II.	Transit	Ingress	24	18	52			III.	Shadow	Ingress	29	0	26
II.	Shadow	Ingress	24	20	46			I.	Shadow	Ingress	29	0	40
II.	Transit	Egress	24	21	49			I.	Transit	Egress	29	2	1
II.	Shadow	Egress	24	23	42			I.	Shadow	Egress	29	3	0
III.	Occult.	Disapp. W.	25	6	45			III.	Shadow	Egress	29	4	8
III.	Occult.	Reapp. W.	25	10	28			I.	Occult.	Disapp.	29	20	49
III.	Eclipse	Disapp. W.	25	10	37 29.9			I.	Eclipse	Reapp.	30	0	6 52.2
I.	Transit	Ingress W.	25	10	47			II.	Occult.	Disapp.	30	3	7
I.	Shadow	Ingress W.	25	11	43			II.	Eclipse	Reapp. W.	30	8	4 32.9
I.	Transit	Egress W.	25	13	7			I.	Transit	Ingress	30	18	8
I.	Shadow	Egress W.	25	14	3			I.	Shadow	Ingress	30	19	9
III.	Eclipse	Reapp. W.	25	14	10 9.5			I.	Transit	Egress	30	20	28
I.	Occult.	Disapp. W.	26	7	55			I.	Shadow	Egress	30	21	29
I.	Eclipse	Reapp. W.	26	11	9 30.5			I.	Occult.	Disapp.	31	15	16
II.	Occult.	Disapp. W.	26	13	55			I.	Eclipse	Reapp.	31	18	35 31.5
II.	Eclipse	Reapp.	26	18	45 49.1			II.	Transit	Ingress	31	21	14
I.	Transit	Ingress	27	5	14			II.	Shadow	Ingress	31	23	21

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		r *
II.		r *
III.		r *
IV.		d * r *

JUPITER'S SATELLITES, 1861. 443

WASHINGTON MEAN TIME.

APRIL.

		d	h	m	s			d	h	m	s
II.	Transit	Egress	1	0	13	II.	Shadow	Egress	8	4	53
II.	Shadow	Egress	1	2	17	III.	Occult.	Disapp. W.	8	13	58
III.	Occult.	Disapp. W.	1	10	19	I.	Transit	Ingress	8	14	25
I.	Transit	Ingress W.	1	12	35	I.	Shadow	Ingress	8	15	33
I.	Shadow	Ingress W.	1	13	38	I.	Transit	Egress	8	16	45
III.	Occult.	Reapp. W.	1	14	2	III.	Occult.	Reapp.	8	17	41
III.	Eclipse	Disapp. W.	1	14	36 46.3	I.	Shadow	Egress	8	17	53
I.	Transit	Egress	1	14	55	III.	Eclipse	Disapp.	8	18	36 38.8
I.	Shadow	Egress	1	15	58	III.	Eclipse	Reapp.	8	22	8 56.8
III.	Eclipse	Reapp.	1	18	9 15.5	I.	Occult.	Disapp. W.	9	11	33
I.	Occult.	Disapp. W.	2	9	43	I.	Eclipse	Reapp.	9	14	59 1.9
I.	Eclipse	Reapp. W.	2	13	4 13.3	II.	Occult.	Disapp.	9	18	47
II.	Occult.	Disapp.	2	16	20	II.	Eclipse	Reapp.	9	23	59 19.9
II.	Eclipse	Reapp.	2	21	22 32.4	I.	Transit	Ingress W.	10	8	53
I.	Transit	Ingress W.	3	7	3	I.	Shadow	Ingress W.	10	10	2
I.	Shadow	Ingress W.	3	8	7	I.	Transit	Egress W.	10	11	13
I.	Transit	Egress W.	3	9	23	I.	Shadow	Egress W.	10	12	22
I.	Shadow	Egress W.	3	10	27	I.	Occult.	Disapp	11	6	1
I.	Occult.	Disapp.	4	4	11	I.	Eclipse	Reapp. W.	11	9	27 42.8
I.	Eclipse	Reapp. W.	4	7	32 53.0	II.	Transit	Ingress W.	11	12	54
II.	Transit	Ingress W.	4	10	28	II.	Shadow	Ingress	11	15	15
II.	Shadow	Ingress W.	4	12	39	II.	Transit	Egress	11	15	50
II.	Transit	Egress W.	4	13	22	II.	Shadow	Egress	11	18	11
II.	Shadow	Egress W.	4	15	35	I.	Transit	Ingress	12	3	21
III.	Transit	Ingress	5	0	2	III.	Transit	Ingress	12	3	43
I.	Transit	Ingress	5	1	30	I.	Shadow	Ingress	12	4	30
I.	Shadow	Ingress	5	2	36	I.	Transit	Egress	12	5	41
III.	Transit	Egress	5	3	47	I.	Shadow	Egress	12	6	50
I.	Transit	Egress	5	3	50	III.	Transit	Egress W.	12	7	26
III.	Shadow	Ingress	5	4	25	III.	Shadow	Ingress W.	12	8	24
I.	Shadow	Egress	5	4	56	III.	Shadow	Egress W.	12	12	6
IV.	Transit	Ingress	5	6	4	I.	Occult.	Disapp.	13	0	29
III.	Shadow	Egress W.	5	8	7	I.	Eclipse	Reapp.	13	3	56 29.0
IV.	Transit	Egress W.	5	10	58	II.	Occult.	Disapp. W.	13	8	1
IV.	Shadow	Ingress	5	16	19	II.	Eclipse	Reapp. W.	13	13	17 44.3
IV.	Shadow	Egress	5	21	12	IV.	Occult.	Disapp.	13	15	48
I.	Occult.	Disapp.	5	23	38	IV.	Occult.	Reapp.	13	20	42
I.	Eclipse	Reapp.	6	2	1 37.8	I.	Transit	Ingress	13	21	49
II.	Occult.	Disapp.	6	5	33	I.	Shadow	Ingress	13	22	59
II.	Eclipse	Reapp. W.	6	10	41 11.2	I.	Transit	Egress	14	0	9
I.	Transit	Ingress	6	19	58	I.	Shadow	Egress	14	1	19
I.	Shadow	Ingress	6	21	5	IV.	Eclipse	Disapp.	14	3	4 55.5
I.	Transit	Egress	6	22	18	IV.	Eclipse	Reapp. W.	14	7	45 31.1
I.	Shadow	Egress	6	23	25	I.	Occult.	Disapp.	14	18	57
I.	Occult.	Disapp.	7	17	6	I.	Eclipse	Reapp.	14	22	25 10.8
I.	Eclipse	Reapp.	7	20	30 18.3	II.	Transit	Ingress	15	2	9
II.	Transit	Ingress	7	23	41	II.	Shadow	Ingress	15	4	33
II.	Shadow	Ingress	8	1	57	II.	Transit	Egress	15	5	5
II.	Transit	Egress	8	2	37	II.	Shadow	Egress W.	15	7	29

444 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

APRIL.

			d	h	m	s				d	h	m	s
I.	Transit	Ingress	15	16	17		I.	Shadow	Ingress	22	19	23	
I.	Shadow	Ingress	15	17	28		I.	Transit	Egress	22	20	30	
III.	Occult.	Disapp.	15	17	41		III.	Occult.	Disapp.	22	21	29	
I.	Transit	Egress	15	18	37		I.	Shadow	Egress	22	21	43	
I.	Shadow	Egress	15	19	48		III.	Occult.	Reapp.	23	1	12	
III.	Occult.	Reapp.	15	21	24		III.	Eclipse	Disapp.	23	2	35	13.6
III.	Eclipse	Disapp.	15	22	35	57.1	III.	Eclipse	Reapp.	23	6	7	6.6
III.	Eclipse	Reapp.	16	2	8	3.1	I.	Occult.	Disapp.	23	15	27	
I.	Occult.	Disapp. W.	16	13	25		I.	Eclipse	Reapp.	23	18	48	52.0
I.	Eclipse	Reapp.	16	16	53	55.3	II.	Occult.	Disapp.	23	23	48	
II.	Occult.	Disapp.	16	21	16		II.	Eclipse	Reapp.	24	5	12	6.1
II.	Eclipse	Reapp.	17	2	35	41.8	I.	Transit	Ingress W.	24	12	38	
I.	Transit	Ingress W.	17	10	45		I.	Shadow	Ingress	24	13	52	
I.	Shadow	Ingress W.	17	11	57		I.	Transit	Egress	24	14	58	
I.	Transit	Egress W.	17	13	5		I.	Shadow	Egress	24	16	12	
I.	Shadow	Egress	17	14	17		I.	Occult.	Disapp. W.	25	9	45	
I.	Occult.	Disapp. W.	18	7	53		I.	Eclipse	Reapp. W.	25	13	17	34.1
I.	Eclipse	Reapp. W.	18	11	22	36.6	II.	Transit	Ingress	25	17	55	
II.	Transit	Ingress	18	15	24		II.	Shadow	Ingress	25	20	26	
II.	Shadow	Ingress	18	17	51		II.	Transit	Egress	25	20	52	
II.	Transit	Egress	18	18	20		II.	Shadow	Egress	25	23	23	
II.	Shadow	Egress	18	20	47		I.	Transit	Ingress	26	7	6	
I.	Transit	Ingress	19	5	13		I.	Shadow	Ingress W.	26	8	21	
I.	Shadow	Ingress	19	6	25		I.	Transit	Egress W.	26	9	26	
III.	Transit	Ingress W.	19	7	29		I.	Shadow	Egress W.	26	10	41	
I.	Transit	Egress W.	19	7	33		III.	Transit	Ingress W.	26	11	19	
I.	Shadow	Egress W.	19	8	45		III.	Transit	Egress	26	15	2	
III.	Transit	Egress W.	19	11	12		III.	Shadow	Ingress	26	16	24	
III.	Shadow	Ingress W.	19	12	24		III.	Shadow	Egress	26	20	5	
III.	Shadow	Egress	19	16	6		I.	Occult.	Disapp.	27	4	13	
I.	Occult.	Disapp.	20	2	21		I.	Eclipse	Reapp. W.	27	7	46	22.3
I.	Eclipse	Reapp.	20	5	51	24.0	II.	Occult.	Disapp.	27	13	4	
II.	Occult.	Disapp. W.	20	10	32		II.	Eclipse	Reapp.	27	18	30	28.0
II.	Eclipse	Reapp.	20	15	54	9.6	I.	Transit	Ingress	28	1	35	
I.	Transit	Ingress	20	23	41		I.	Shadow	Ingress	28	2	50	
I.	Shadow	Ingress	21	0	54		I.	Transit	Egress	28	3	55	
I.	Transit	Egress	21	2	1		I.	Shadow	Egress	28	5	10	
I.	Shadow	Egress	21	3	14		I.	Occult.	Disapp.	28	22	42	
I.	Occult.	Disapp.	21	20	49		I.	Eclipse	Reapp.	29	2	15	5.6
IV.	Transit	Ingress	21	22	42		II.	Transit	Ingress	29	7	12	
I.	Eclipse	Reapp.	22	0	20	6.3	II.	Shadow	Ingress W.	29	9	44	
IV.	Transit	Egress	22	3	36		II.	Transit	Egress W.	29	10	8	
II.	Transit	Ingress	22	4	40		II.	Shadow	Egress W.	29	12	40	
II.	Shadow	Ingress	22	7	8		I.	Transit	Ingress	29	20	3	
II.	Transit	Egress W.	22	7	36		I.	Shadow	Ingress	29	21	18	
II.	Shadow	Egress W.	22	10	5		I.	Transit	Egress	29	22	23	
IV.	Shadow	Ingress W.	22	10	21		I.	Shadow	Egress	29	23	38	
IV.	Shadow	Egress	22	15	11		III.	Occult.	Disapp.	30	1	21	
I.	Transit	Ingress	22	18	10		III.	Occult.	Reapp.	30	5	4	

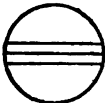
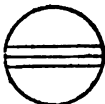
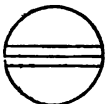
JUPITER'S SATELLITES, 1861. 445

WASHINGTON MEAN TIME.

APRIL.

III. Eclipse	Disapp.	d	h	m	s	I. Occult.	Disapp.	d	h	m	s
IV. Occult.	Disapp. W.	30	6	34	20.1	I. Eclipse	Reapp.	30	20	43	52.3
III. Eclipse	Reapp. W.	30	10	5	59.5	IV. Eclipse	Disapp.	30	21	7	53.4
IV. Occult.	Reapp.	30	13	52							

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		r	•	III.		d	•	r	•
II.		r	•	IV.		d	•	r	•

MAY.

IV. Eclipse	Reapp.	d	h	m	s	I. Transit	Ingress	d	h	m	s
II. Occult.	Disapp.	1	2	21		I. Shadow	Ingress	5	3	29	
II. Eclipse	Reapp. W.	1	7	48	21.4	I. Transit	Egress	5	5	49	
I. Transit	Ingress	1	14	32		I. Shadow	Egress	5	7	4	
I. Shadow	Ingress	1	15	47		I. Occult.	Disapp.	6	0	36	
I. Transit	Egress	1	16	52		I. Eclipse	Reapp.	6	4	10	8.1
I. Shadow	Egress	1	18	7		II. Transit	Ingress W.	6	9	47	
I. Occult.	Disapp. W.	2	11	39		II. Shadow	Ingress W.	6	12	20	
I. Eclipse	Reapp.	2	15	12	35.2	II. Transit	Egress	6	12	43	
II. Transit	Ingress	2	20	30		II. Shadow	Egress	6	15	17	
II. Shadow	Ingress	2	23	3		I. Transit	Ingress	6	21	57	
II. Transit	Egress	2	23	26		I. Shadow	Ingress	6	23	13	
II. Shadow	Egress	3	2	0		I. Transit	Egress	7	0	17	
I. Transit	Ingress W.	3	9	0		I. Shadow	Egress	7	1	33	
I. Shadow	Ingress W.	3	10	16		III. Occult.	Disapp.	7	5	17	
I. Transit	Egress W.	3	11	20		III. Occult.	Reapp. W.	7	9	0	
I. Shadow	Egress W.	3	12	36		III. Eclipse	Disapp. W.	7	10	33	33.8
III. Transit	Ingress	3	15	14		III. Eclipse	Reapp.	7	14	4	58.6
III. Transit	Egress	3	18	57		I. Occult.	Disapp.	7	19	5	
III. Shadow	Ingress	3	20	24		I. Eclipse	Reapp.	7	22	38	55.4
III. Shadow	Egress	4	0	5		II. Occult.	Disapp.	8	4	57	
I. Occult.	Disapp.	4	6	7		II. Eclipse	Reapp. W.	8	10	24	27.7
I. Eclipse	Reapp. W.	4	9	41	24.0	IV. Transit	Ingress	8	16	16	
II. Occult.	Disapp.	4	15	39		I. Transit	Ingress	8	16	26	
II. Eclipse	Reapp.	4	21	6	36.9	I. Shadow	Ingress	8	17	42	

446 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

MAY.

I.	Transit	Egress	d	h	m	s	I.	Occult.	Disapp.	d	h	m	s
I.	Shadow	Egress	8	18	46		I.	Eclipse	Reapp.	16	15	29	
IV.	Transit	Egress	8	20	2		II.	Transit	Ingress	16	19	2	43.2
IV.	Shadow	Ingress	8	21	11		IV.	Occult.	Disapp.	17	1	43	
IV.	Shadow	Egress W.	9	4	22		II.	Shadow	Ingress	17	2	58	
I.	Occult.	Disapp.	9	9	10		II.	Transit	Egress	17	4	15	
I.	Eclipse	Reapp.	9	13	33		II.	Shadow	Egress	17	4	40	
II.	Transit	Ingress	9	17	7	38.6	IV.	Shadow	Egress	17	7	12	
II.	Shadow	Ingress	9	23	5		IV.	Occult.	Reapp.	17	7	53	
II.	Transit	Egress	10	1	39		I.	Transit	Ingress	17	12	50	
II.	Shadow	Egress	10	2	2		I.	Shadow	Ingress	17	12	50	
II.	Shadow	Egress	10	4	35		I.	Transit	Egress	17	14	6	
I.	Transit	Ingress W.	10	10	54		IV.	Eclipse	Disapp.	17	15	10	22.5
I.	Shadow	Ingress W.	10	12	10		I.	Shadow	Egress	17	15	10	22.5
I.	Transit	Egress	10	13	14		IV.	Eclipse	Reapp.	17	16	26	
I.	Shadow	Egress	10	14	30		IV.	Shadow	Reapp.	17	19	46	40.3
III.	Transit	Ingress	10	19	12		III.	Transit	Ingress	17	23	15	
III.	Shadow	Egress	10	22	55		III.	Transit	Egress	18	2	58	
III.	Shadow	Ingress	11	0	23		III.	Shadow	Ingress	18	4	22	
III.	Shadow	Egress	11	4	4		III.	Shadow	Egress W.	18	8	3	
I.	Occult.	Disapp. W.	11	8	2		I.	Occult.	Disapp. W.	18	9	58	
I.	Eclipse	Reapp. W.	11	11	36	28.1	I.	Eclipse	Reapp.	18	13	31	33.0
II.	Occult.	Disapp.	11	18	15		II.	Occult.	Disapp.	18	20	53	
II.	Eclipse	Reapp.	11	23	42	36.2	II.	Eclipse	Reapp.	19	2	18	25.5
I.	Transit	Ingress	12	5	23		I.	Transit	Ingress	19	7	19	
I.	Shadow	Ingress	12	6	39		I.	Shadow	Ingress W.	19	8	35	
I.	Transit	Egress	12	7	43		I.	Transit	Egress W.	19	9	39	
I.	Shadow	Egress W.	12	8	59		I.	Shadow	Egress W.	19	10	55	
I.	Occult.	Disapp.	13	2	31		I.	Occult.	Disapp.	20	4	27	
I.	Eclipse	Reapp.	13	6	5	12.2	I.	Eclipse	Reapp. W.	20	8	0	17.8
II.	Transit	Ingress	13	12	24		II.	Transit	Ingress	20	15	4	
II.	Shadow	Ingress	13	14	57		II.	Shadow	Ingress	20	17	33	
II.	Transit	Egress	13	15	20		II.	Transit	Egress	20	18	0	
II.	Shadow	Egress	13	17	53		II.	Shadow	Egress	20	20	30	
I.	Transit	Ingress	13	23	52		I.	Transit	Ingress	21	1	48	
I.	Shadow	Ingress	14	1	8		I.	Shadow	Ingress	21	3	3	
I.	Transit	Egress	14	2	12		I.	Transit	Egress	21	4	8	
I.	Shadow	Egress	14	3	28		I.	Shadow	Egress	21	5	23	
III.	Occult.	Disapp. W.	14	9	18		III.	Occult.	Disapp.	21	13	22	
III.	Occult.	Reapp.	14	13	1		III.	Occult.	Reapp.	21	17	5	
III.	Eclipse	Disapp.	14	14	33	19.7	III.	Eclipse	Disapp.	21	18	32	54.2
III.	Eclipse	Reapp.	14	18	4	29.3	III.	Eclipse	Reapp.	21	22	3	47.6
I.	Occult.	Disapp.	14	21	0		I.	Occult.	Disapp.	21	22	56	
I.	Eclipse	Reapp.	15	0	34	0.0	I.	Eclipse	Reapp.	22	2	29	5.8
II.	Occult.	Disapp.	15	7	34		II.	Occult.	Disapp. W.	22	10	13	
II.	Eclipse	Reapp.	15	13	0	24.1	II.	Eclipse	Reapp.	22	15	36	9.8
I.	Transit	Ingress	15	18	21		I.	Transit	Ingress	22	20	17	
I.	Shadow	Ingress	15	19	37		I.	Shadow	Ingress	22	21	32	
I.	Transit	Egress	15	20	41		I.	Transit	Egress	22	22	37	
I.	Shadow	Egress	15	21	57		I.	Shadow	Egress	22	23	52	
							I.	Occult.	Disapp.	23	17	26	

JUPITER'S SATELLITES, 1861. 447

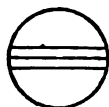
WASHINGTON MEAN TIME.

MAY.

I. Eclipse	Reapp.	^d 23 ^h 20 ^m 57 ^s 49.1	II. Transit	Egress	^d 27 ^h 20 ^m 40 ^s
II. Transit	Ingress	24 4 33	II. Shadow	Egress	27 23 6
II. Shadow	Ingress	24 6 52	I. Transit	Ingress	28 3 44
II. Transit	Egress	24 7 20	I. Shadow	Ingress	28 4 58
II. Shadow	Egress W.	24 9 48	I. Transit	Egress	28 6 4
I. Transit	Ingress	24 14 46	I. Shadow	Egress	28 7 18
I. Shadow	Ingress	24 16 1	III. Occult.	Disapp.	28 17 31
I. Transit	Egress	24 17 6	III. Occult.	Reapp.	28 21 14
I. Shadow	Egress	24 18 21	III. Eclipse	Disapp.	28 22 32 58.5
III. Transit	Ingress	25 3 20	I. Occult.	Disapp.	29 0 54
III. Transit	Egress	25 7 3	III. Eclipse	Reapp.	29 2 3 34.9
III. Shadow	Ingress W.	25 8 21	I. Eclipse	Reapp.	29 4 24 12.2
IV. Transit	Ingress W.	25 10 40	II. Occult.	Disapp.	29 12 53
I. Occult.	Disapp.	25 11 55	II. Eclipse	Reapp.	29 18 11 44.8
III. Shadow	Egress	25 12 2	I. Transit	Ingress	29 22 14
I. Eclipse	Reapp.	25 15 26 59.2	I. Shadow	Ingress	29 23 27
IV. Transit	Egress	25 15 35	I. Transit	Egress	30 0 34
IV. Shadow	Ingress	25 22 24	I. Shadow	Egress	30 1 47
II. Occult.	Disapp.	25 23 33	I. Occult.	Disapp.	30 19 23
IV. Shadow	Egress	26 3 12	I. Eclipse	Reapp.	30 22 52 55.1
II. Eclipse	Reapp.	26 4 54 4.3	II. Transit	Ingress	31 7 5
I. Transit	Ingress W.	26 9 15	II. Shadow	Ingress W.	31 9 29
I. Shadow	Ingress W.	26 10 29	II. Transit	Egress W.	31 10 1
I. Transit	Egress	26 11 35	II. Shadow	Egress	31 12 25
I. Shadow	Egress	26 12 49	I. Transit	Ingress	31 16 43
I. Occult.	Disapp.	27 6 24	I. Shadow	Ingress	31 17 56
I. Eclipse	Reapp. W.	27 9 55 23.7	I. Transit	Egress	31 19 3
II. Transit	Ingress	27 17 44	I. Shadow	Egress	31 20 16
II. Shadow	Ingress	27 20 10			

Phases of the Eclipses of the Satellites for an Inverting Telescope.

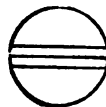
I.



r



III.



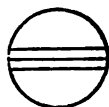
d



r



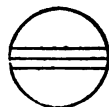
II.



r



IV.



d



r



448 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JUNE.

			d	h	m	s				d	h	m	s
III.	Transit	Ingress	1	7	29		III.	Transit	Egress	8	15	24	
III.	Transit	Egress	1	11	12		I.	Occult.	Disapp.	8	15	51	
III.	Shadow	Ingress	1	12	21		III.	Shadow	Ingress	8	16	20	
I.	Occult.	Disapp.	1	13	52		I.	Eclipse	Reapp.	8	19	16	50.3
III.	Shadow	Egress	1	16	1		III.	Shadow	Egress	8	20	0	
I.	Eclipse	Reapp.	1	17	21	45.0	II.	Occult.	Disapp.	9	4	56	
II.	Occult.	Disapp.	2	2	14		II.	Eclipse	Reapp. W.	9	10	4	49.2
II.	Eclipse	Reapp.	2	7	29	32.0	I.	Transit	Ingress	9	13	11	
I.	Transit	Ingress	2	11	13		I.	Shadow	Ingress	9	14	19	
I.	Shadow	Ingress	2	12	24		I.	Transit	Egress	9	15	31	
I.	Transit	Egress	2	13	33		I.	Shadow	Egress	9	16	39	
I.	Shadow	Egress	2	14	44		I.	Occult.	Disapp. W.	10	10	20	
IV.	Occult.	Disapp.	2	21	45		I.	Eclipse	Reapp.	10	13	45	34.4
IV.	Occult.	Reapp.	3	2	40		II.	Transit	Ingress	10	23	11	
I.	Occult.	Disapp. W.	3	8	22		II.	Shadow	Ingress	11	1	24	
IV.	Eclipse	Disapp. W.	3	9	12	41.4	II.	Transit	Egress	11	2	7	
I.	Eclipse	Reapp.	3	11	50	29.1	II.	Shadow	Egress	11	4	20	
IV.	Eclipse	Reapp.	3	13	46	23.8	IV.	Transit	Ingress	11	5	44	
II.	Transit	Ingress	3	20	26		I.	Transit	Ingress	11	7	40	
II.	Shadow	Ingress	3	22	47		I.	Shadow	Ingress W.	11	8	47	
II.	Transit	Egress	3	23	22		I.	Transit	Egress W.	11	10	0	
II.	Shadow	Egress	4	1	43		IV.	Transit	Egress W.	11	10	39	
I.	Transit	Ingress	4	5	42		I.	Shadow	Egress	11	11	7	
I.	Shadow	Ingress	4	6	53		IV.	Shadow	Ingress	11	16	25	
I.	Transit	Egress	4	8	2		IV.	Shadow	Egress	11	21	10	
I.	Shadow	Egress W.	4	9	13		III.	Occult.	Disapp.	12	1	55	
III.	Occult.	Disapp.	4	21	42		I.	Occult.	Disapp.	12	4	50	
III.	Occult.	Reapp.	5	1	24		III.	Occult.	Reapp.	12	5	38	
III.	Eclipse	Disapp.	5	2	32	24.0	III.	Eclipse	Disapp.	12	6	31	42.4
I.	Occult.	Disapp.	5	2	51		I.	Eclipse	Reapp. W.	12	8	14	22.7
III.	Eclipse	Reapp.	5	6	2	42.0	III.	Eclipse	Reapp. W.	12	10	1	42.4
I.	Eclipse	Reapp.	5	6	19	17.6	II.	Occult.	Disapp.	12	18	17	
II.	Occult.	Disapp.	5	15	35		II.	Eclipse	Reapp.	12	23	22	21.6
II.	Eclipse	Reapp.	5	20	47	8.6	I.	Transit	Ingress	13	2	10	
I.	Transit	Ingress	6	0	12		I.	Shadow	Ingress	13	3	16	
I.	Shadow	Ingress	6	1	21		I.	Transit	Egress	13	4	30	
I.	Transit	Egress	6	2	32		I.	Shadow	Egress	13	5	36	
I.	Shadow	Egress	6	3	41		I.	Occult.	Disapp.	13	23	20	
I.	Occult.	Disapp.	6	21	21		I.	Eclipse	Reapp.	14	2	43	5.5
I.	Eclipse	Reapp.	7	0	48	1.5	II.	Transit	Ingress	14	12	32	
II.	Transit	Ingress W.	7	9	48		II.	Shadow	Ingress	14	14	43	
II.	Shadow	Ingress	7	12	6		II.	Transit	Egress	14	15	29	
II.	Transit	Egress	7	12	44		II.	Shadow	Egress	14	17	39	
II.	Shadow	Egress	7	15	2		I.	Transit	Ingress	14	20	39	
I.	Transit	Ingress	7	18	41		I.	Shadow	Ingress	14	21	45	
I.	Shadow	Ingress	7	19	50		I.	Transit	Egress	14	22	59	
I.	Transit	Egress	7	21	1		I.	Shadow	Egress	15	0	5	
I.	Shadow	Egress	7	22	10		III.	Transit	Ingress	15	15	55	
III.	Transit	Ingress	8	11	40		I.	Occult.	Disapp.	15	17	50	

JUPITER'S SATELLITES, 1861. 449

WASHINGTON MEAN TIME.

JUNE.

			^d	^h	^m	^s				^d	^h	^m	^s
III.	Transit	Egress	15	19	39			III.	Transit	Egress	22	23	56
III.	Shadow	Ingress	15	20	20			III.	Shadow	Ingress	23	0	19
I.	Eclipse	Reapp.	15	21	11	52.9		III.	Shadow	Egress	23	3	58
III.	Shadow	Egress	15	23	59			II.	Occult.	Disapp.	23	10	23
II.	Occult.	Disapp.	16	7	39			II.	Eclipse	Reapp.	23	15	14 51.2
II.	Eclipse	Reapp.	16	12	39	55.5		I.	Transit	Ingress	23	17	8
I.	Transit	Ingress	16	15	9			I.	Shadow	Ingress	23	18	8
I.	Shadow	Ingress	16	16	13			I.	Transit	Egress	23	19	28
I.	Transit	Egress	16	17	29			I.	Shadow	Egress	23	20	28
I.	Shadow	Egress	16	18	33			I.	Occult.	Disapp.	24	14	19
I.	Occult.	Disapp.	17	12	19			I.	Eclipse	Reapp.	24	17	35 41.4
I.	Eclipse	Reapp.	17	15	40	38.7		II.	Transit	Ingress	25	4	41
II.	Transit	Ingress	18	1	55			II.	Shadow	Ingress	25	6	38
II.	Shadow	Ingress	18	4	1			II.	Transit	Egress	25	7	37
II.	Transit	Egress	18	4	51			II.	Shadow	Egress W.	25	9	34
II.	Shadow	Egress	18	6	57			I.	Transit	Ingress	25	11	38
I.	Transit	Ingress W.	18	9	39			I.	Shadow	Ingress	25	12	37
I.	Shadow	Ingress	18	10	42			I.	Transit	Egress	25	13	58
I.	Transit	Egress	18	11	59			I.	Shadow	Egress	25	14	57
I.	Shadow	Egress	18	13	2			I.	Occult.	Disapp. W.	26	8	49
III.	Occult.	Disapp.	19	6	11			III.	Occult.	Disapp.	26	10	29
I.	Occult.	Disapp.	19	6	49			I.	Eclipse	Reapp.	26	12	4 29.2
III.	Occult.	Reapp. W.	19	9	53			III.	Occult.	Reapp.	26	14	11
I.	Eclipse	Reapp.	19	10	9	26.9		III.	Eclipse	Disapp.	26	14	29 58.6
III.	Eclipse	Disapp.	19	10	30	48.6		III.	Eclipse	Reapp.	26	17	59 18.6
III.	Eclipse	Reapp.	19	14	0	29.0		II.	Occult.	Disapp.	26	23	45
IV.	Occult.	Disapp.	19	17	10			II.	Eclipse	Reapp.	27	4	32 14.8
II.	Occult.	Disapp.	19	21	1			I.	Transit	Ingress	27	6	8
IV.	Occult.	Reapp.	19	22	5			I.	Shadow	Ingress	27	7	5
II.	Eclipse	Reapp.	20	1	57	22.5		I.	Transit	Egress W.	27	8	28
IV.	Eclipse	Disapp.	20	3	15	23.2		I.	Shadow	Egress W.	27	9	25
I.	Transit	Ingress	20	4	9			IV.	Transit	Ingress	28	1	25
I.	Shadow	Ingress	20	5	11			I.	Occult.	Disapp.	28	3	19
I.	Transit	Egress	20	6	29			IV.	Transit	Egress	28	6	18
I.	Shadow	Egress	20	7	31			I.	Eclipse	Reapp.	28	6	33 10.4
IV.	Eclipse	Reapp.	20	7	46	14.0		IV.	Shadow	Ingress	28	10	27
I.	Occult.	Disapp.	21	1	19			IV.	Shadow	Egress	28	15	8
I.	Eclipse	Reapp.	21	4	38	8.8		II.	Transit	Ingress	28	18	5
II.	Transit	Ingress	21	15	18			II.	Shadow	Ingress	28	19	57
II.	Shadow	Ingress	21	17	20			II.	Transit	Egress	28	21	1
II.	Transit	Egress	21	18	14			II.	Shadow	Egress	28	22	53
II.	Shadow	Egress	21	20	16			I.	Transit	Ingress	29	0	38
I.	Transit	Ingress	21	22	38			I.	Shadow	Ingress	29	1	34
I.	Shadow	Ingress	21	23	39			I.	Transit	Egress	29	2	58
I.	Transit	Egress	22	0	58			I.	Shadow	Egress	29	3	54
I.	Shadow	Egress	22	1	59			I.	Occult.	Disapp.	29	21	49
I.	Occult.	Disapp.	22	19	49			III.	Transit	Ingress	30	0	32
III.	Transit	Ingress	22	20	13			I.	Eclipse	Reapp.	30	1	1 59.1
I.	Eclipse	Reapp.	22	23	6	58.4		III.	Transit	Egress	30	4	14

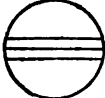



450 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JUNE.

III. Shadow	Ingress	d	h	m	s	I. Transit	Ingress	d	h	m	s
III. Shadow	Egress	30	4	18		I. Shadow	Ingress	30	19	8	
II. Occult.	Disapp.	30	7	57		I. Transit	Egress	30	20	3	
II. Eclipse	Reapp.	30	13	8		I. Shadow	Egress	30	21	28	
		30	17	49	36.5			30	22	23	

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		r *	III.		d * r *
II.		r *	IV.		d * r *

JULY.

I. Occult.	Disapp.	d	h	m	s	II. Shadow	Egress	d	h	m	s
I. Eclipse	Reapp.	1	16	19		I. Transit	Ingress	6	1	29	
II. Transit	Ingress	1	19	30	41.4	I. Shadow	Ingress	6	2	38	
II. Shadow	Ingress W.	2	7	28		I. Transit	Egress	6	3	29	
II. Transit	Egress	2	9	15		I. Shadow	Egress	6	4	58	
II. Shadow	Egress	2	10	24		I. Transit	Egress	6	5	49	
I. Transit	Ingress	2	12	10		IV. Occult.	Disapp.	6	13	5	
I. Shadow	Ingress	2	13	38		IV. Occult.	Reapp.	6	17	57	
I. Transit	Egress	2	14	31		IV. Eclipse	Disapp.	6	21	17	17.0
I. Shadow	Egress	2	15	58		I. Occult.	Disapp.	6	23	49	
I. Transit	Egress	2	16	51		IV. Eclipse	Reapp.	7	1	44	57.8
I. Occult.	Disapp.	3	10	49		I. Eclipse	Reapp.	7	2	56	57.0
I. Eclipse	Reapp.	3	13	59	28.6	III. Transit	Ingress	7	4	53	
III. Occult.	Disapp.	3	14	50		III. Shadow	Ingress W.	7	8	17	
III. Eclipse	Reapp.	3	21	58	36.8	III. Transit	Egress W.	7	8	35	
II. Occult.	Disapp.	4	2	30		III. Shadow	Egress	7	11	56	
II. Eclipse	Reapp.	4	7	6	55.7	II. Occult.	Disapp.	7	15	53	
I. Transit	Ingress W.	4	8	8		II. Eclipse	Reapp.	7	20	24	11.8
I. Shadow	Ingress W.	4	9	0		I. Transit	Ingress	7	21	8	
I. Transit	Egress	4	10	28		I. Shadow	Ingress	7	21	57	
I. Shadow	Egress	4	11	20		I. Transit	Egress	7	23	28	
I. Occult.	Disapp.	5	5	19		I. Shadow	Egress	8	0	17	
I. Eclipse	Reapp. W.	5	8	28	9.1	I. Occult.	Disapp.	8	18	19	
II. Transit	Ingress	5	20	52		I. Eclipse	Reapp.	8	21	25	38.9
II. Shadow	Ingress	5	22	34		II. Transit	Ingress	9	10	16	
II. Transit	Egress	5	23	49		II. Shadow	Ingress	9	11	52	

JUPITER'S SATELLITES, 1861. 451

WASHINGTON MEAN TIME.

JULY.

II.	Transit	Egress	9	13	13		I.	Shadow	Ingress	16	18	21
II.	Shadow	Egress	9	14	48		I.	Transit	Egress	16	19	58
I.	Transit	Ingress	9	15	38		I.	Shadow	Egress	16	20	41
I.	Shadow	Ingress	9	16	26		I.	Occult.	Disapp.	17	14	50
I.	Transit	Egress	9	17	58		I.	Eclipse	Reapp.	17	17	49 19.6
I.	Shadow	Egress	9	18	46		III.	Occult.	Disapp.	17	23	35
I.	Occult.	Disapp.	10	12	49		III.	Eclipse	Reapp.	18	5	57 3.8
I.	Eclipse	Reapp.	10	15	54 25.6		II.	Occult.	Disapp. W.	18	8	2
III.	Occult.	Disapp.	10	19	12		I.	Transit	Ingress	18	12	8
III.	Eclipse	Reapp.	11	1	57 38.0		II.	Eclipse	Reapp.	18	12	15 46.9
II.	Occult.	Disapp.	11	5	16		I.	Shadow	Ingress	18	12	49
II.	Eclipse	Reapp.	11	9	41 24.9		I.	Transit	Egress	18	14	28
I.	Transit	Ingress	11	10	8		I.	Shadow	Egress	18	15	9
I.	Shadow	Ingress	11	10	55		I.	Occult.	Disapp.	19	9	20
I.	Transit	Egress	11	12	28		I.	Eclipse	Reapp.	19	12	17 58.3
I.	Shadow	Egress	11	13	15		II.	Transit	Ingress	20	2	30
I.	Occult.	Disapp.	12	7	19		II.	Shadow	Ingress	20	3	48
I.	Eclipse	Reapp.	12	10	23 5.1		II.	Transit	Egress	20	5	26
II.	Transit	Ingress	12	23	41		I.	Transit	Ingress	20	6	39
II.	Shadow	Ingress	13	1	10		II.	Shadow	Egress	20	6	43
II.	Transit	Egress	13	2	37		I.	Shadow	Ingress	20	7	18
II.	Shadow	Egress	13	4	6		I.	Transit	Egress	20	8	59
I.	Transit	Ingress	13	4	38		I.	Shadow	Egress	20	9	38
I.	Shadow	Ingress	13	5	23		I.	Occult.	Disapp.	21	3	51
I.	Transit	Egress	13	6	58		I.	Eclipse	Reapp.	21	6	46 44.6
I.	Shadow	Egress	13	7	43		III.	Transit	Ingress	21	13	38
I.	Occult.	Disapp.	14	1	49		III.	Shadow	Ingress	21	16	14
I.	Eclipse	Reapp.	14	4	51 52.3		III.	Transit	Egress	21	17	20
III.	Transit	Ingress	14	9	15		III.	Shadow	Egress	21	19	52
III.	Shadow	Ingress	14	12	16		II.	Occult.	Disapp.	21	21	26
III.	Transit	Egress	14	12	57		I.	Transit	Ingress	22	1	9
III.	Shadow	Egress	14	15	54		II.	Eclipse	Reapp.	22	1	32 52.4
II.	Occult.	Disapp.	14	18	39		I.	Shadow	Ingress	22	1	47
IV.	Transit	Ingress	14	21	29		I.	Transit	Egress	22	3	29
II.	Eclipse	Reapp.	14	22	58 36.9		I.	Shadow	Egress	22	4	7
I.	Transit	Ingress	14	23	8		I.	Occult.	Disapp.	22	22	21
I.	Shadow	Ingress	14	23	52		I.	Eclipse	Reapp.	23	1	15 24.6
I.	Transit	Egress	15	1	28		IV.	Occult.	Disapp.	23	9	20
I.	Shadow	Egress	15	2	12		IV.	Occult.	Reapp.	23	14	10
IV.	Transit	Egress	15	2	19		IV.	Eclipse	Disapp.	23	15	18 46.5
IV.	Shadow	Ingress	15	4	28		II.	Transit	Ingress	23	15	54
IV.	Shadow	Egress	15	9	6		II.	Shadow	Ingress	23	17	6
I.	Occult.	Disapp.	15	20	19		II.	Transit	Egress	23	18	51
I.	Eclipse	Reapp.	15	23	20 33.6		I.	Transit	Ingress	23	19	39
II.	Transit	Ingress	16	13	5		IV.	Eclipse	Reapp.	23	19	43 1.3
II.	Shadow	Ingress	16	14	29		II.	Shadow	Egress	23	20	2
II.	Transit	Egress	16	16	1		I.	Shadow	Ingress	23	20	15
II.	Shadow	Egress	16	17	24		I.	Transit	Egress	23	21	59
I.	Transit	Ingress	16	17	38		I.	Shadow	Egress	23	22	35

452 JUPITER'S SATELLITES, 1861.

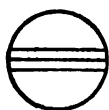
WASHINGTON MEAN TIME.

JULY.

		d	h	m	s			d	h	m	s
I.	Occult.	Disapp.	24	16	51		III.	Transit	Egress	28	21 45
I.	Eclipse	Reapp.	24	19	44	9.6	III.	Shadow	Egress	28	23 50
III.	Occult.	Disapp.	25	4	0		II.	Occult.	Disapp.	29	0 13
III.	Eclipse	Reapp.	25	9	55	47.0	I.	Transit	Ingress	29	3 9
II.	Occult.	Disapp.	25	10	49		I.	Shadow	Ingress	29	3 41
I.	Transit	Ingress	25	14	9		II.	Eclipse	Reapp.	29	4 6 58.6
I.	Shadow	Ingress	25	14	44		I.	Transit	Egress	29	5 29
II.	Eclipse	Reapp.	25	14	49	27.8	I.	Shadow	Egress	29	6 1
I.	Transit	Egress	25	16	29		I.	Occult.	Disapp.	30	0 22
I.	Shadow	Egress	25	17	4		I.	Eclipse	Reapp.	30	3 10 11.5
I.	Occult.	Disapp.	26	11	22		II.	Transit	Ingress	30	18 44
I.	Eclipse	Reapp.	26	14	12	47.3	II.	Shadow	Ingress	30	19 43
II.	Transit	Ingress	27	5	20		I.	Transit	Ingress	30	21 39
II.	Shadow	Ingress	27	6	25		II.	Transit	Egress	30	21 40
II.	Transit	Egress	27	8	16		I.	Shadow	Ingress	30	22 9
I.	Transit	Ingress	27	8	39		II.	Shadow	Egress	30	22 38
I.	Shadow	Ingress	27	9	12		I.	Transit	Egress	30	23 59
II.	Shadow	Egress	27	9	21		I.	Shadow	Egress	31	0 29
I.	Transit	Egress	27	10	59		IV.	Transit	Ingress	31	17 50
I.	Shadow	Egress	27	11	32		I.	Occult.	Disapp.	31	18 53
I.	Occult.	Disapp.	28	5	52		I.	Eclipse	Reapp.	31	21 38 55.4
I.	Eclipse	Reapp.	28	8	41	32.6	IV.	Shadow	Ingress	31	22 29
III.	Transit	Ingress	28	18	4		IV.	Transit	Egress	31	22 36
III.	Shadow	Ingress	28	20	13						

Phases of the Eclipses of the Satellites for an Inverting Telescope.

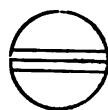
I.



r

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III.



r

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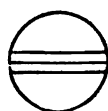
II.



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IV.



d

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The Satellites are not visible from July 31st to October 1st, Jupiter being too near the Sun.

JUPITER'S SATELLITES, 1861. 453

WASHINGTON MEAN TIME.

OCTOBER.

			d	h	m	s				d	h	m	s
II.	Eclipse	Disapp.	1	0	21	54.7	III.	Transit	Ingress	8	14	28	
II.	Occult.	Reapp.	1	4	13		III.	Shadow	Egress	8	15	29	
III.	Shadow	Ingress	1	8	0		III.	Transit	Egress	8	18	0	
III.	Transit	Ingress	1	10	4		I.	Eclipse	Disapp.	8	19	58	37.3
III.	Shadow	Egress	1	11	32		I.	Occult.	Reapp.	8	22	53	
III.	Transit	Egress	1	13	38		I.	Shadow	Ingress W.	9	17	7	
I.	Eclipse	Disapp.	1	18	4	39.3	I.	Transit	Ingress W.	9	17	46	
I.	Occult.	Reapp.	1	20	53		I.	Shadow	Egress	9	19	26	
I.	Shadow	Ingress	2	15	13		I.	Transit	Egress	9	20	5	
I.	Transit	Ingress	2	15	46		II.	Shadow	Ingress	9	21	50	
I.	Shadow	Egress W.	2	17	32		II.	Transit	Ingress	9	23	6	
I.	Transit	Egress	2	18	5		II.	Shadow	Egress	10	0	43	
II.	Shadow	Ingress	2	19	13		II.	Transit	Egress	10	2	0	
II.	Transit	Ingress	2	20	17		I.	Eclipse	Disapp.	10	14	27	9.3
II.	Shadow	Egress	2	22	7		I.	Occult.	Reapp. W.	10	17	23	
II.	Transit	Egress	2	23	11		I.	Shadow	Ingress	11	11	35	
I.	Eclipse	Disapp.	3	12	33	18.0	I.	Transit	Ingress	11	12	16	
I.	Occult.	Reapp.	3	15	23		I.	Shadow	Egress	11	13	54	
I.	Shadow	Ingress	4	9	41		I.	Transit	Egress	11	14	35	
I.	Transit	Ingress	4	10	16		II.	Eclipse	Disapp. W.	11	16	12	6.4
I.	Shadow	Egress	4	12	0		II.	Occult.	Reapp.	11	20	22	
I.	Transit	Egress	4	12	35		III.	Eclipse	Disapp.	12	2	13	22.6
II.	Eclipse	Disapp.	4	13	38	38.3	III.	Occult.	Reapp.	12	8	25	
II.	Occult.	Reapp. W.	4	17	36		I.	Eclipse	Disapp.	12	8	55	33.4
III.	Eclipse	Disapp.	4	22	14	47.5	I.	Occult.	Reapp.	12	11	53	
III.	Occult.	Reapp.	5	4	2		I.	Shadow	Ingress	13	6	3	
I.	Eclipse	Disapp.	5	7	1	38.8	I.	Transit	Ingress	13	6	45	
I.	Occult.	Reapp.	5	9	53		I.	Shadow	Egress	13	8	22	
I.	Shadow	Ingress	6	4	10		I.	Transit	Egress	13	9	4	
I.	Transit	Ingress	6	4	46		II.	Shadow	Ingress	13	11	8	
I.	Shadow	Egress	6	6	29		II.	Transit	Ingress	13	12	30	
I.	Transit	Egress	6	7	5		II.	Shadow	Egress	13	14	1	
II.	Shadow	Ingress	6	8	32		II.	Transit	Egress	13	15	24	
II.	Transit	Ingress	6	9	42		I.	Eclipse	Disapp.	14	3	24	3.5
II.	Shadow	Egress	6	11	26		I.	Occult.	Reapp.	14	6	23	
II.	Transit	Egress	6	12	36		I.	Shadow	Ingress	15	0	31	
IV.	Shadow	Ingress	6	22	27		I.	Transit	Ingress	15	1	15	
I.	Eclipse	Disapp.	7	1	30	10.7	I.	Shadow	Egress	15	2	50	
IV.	Shadow	Egress	7	2	45		I.	Transit	Egress	15	3	34	
IV.	Transit	Ingress	7	4	10		II.	Eclipse	Disapp.	15	5	28	50.4
I.	Occult.	Reapp.	7	4	23		IV.	Eclipse	Disapp.	15	9	20	35.7
IV.	Transit	Egress	7	8	28		II.	Occult.	Reapp.	15	9	45	
I.	Shadow	Ingress	7	22	38		IV.	Eclipse	Reapp.	15	13	22	59.5
I.	Transit	Ingress	7	23	16		III.	Shadow	Ingress	15	15	54	
I.	Shadow	Egress	8	0	57		IV.	Occult.	Disapp. W.	15	16	10	
I.	Transit	Egress	8	1	35		III.	Transit	Ingress	15	18	52	
II.	Eclipse	Disapp.	8	2	55	22.6	III.	Shadow	Egress	15	19	27	
II.	Occult.	Reapp.	8	6	59		IV.	Occult.	Reapp.	15	20	22	
III.	Shadow	Ingress	8	11	57		I.	Eclipse	Disapp.	15	21	52	28.8

454 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

OCTOBER.

		d	h	m	s			d	h	m	s
III.	Transit	Egress	15	22	23		I.	Transit	Egress	24	0 2
I.	Occult.	Reapp.	16	0	53		IV.	Transit	Ingress	24	0 26
I.	Shadow	Ingress	16	19	0		II.	Shadow	Ingress	24	3 0
I.	Transit	Ingress	16	19	45		IV.	Transit	Egress	24	4 30
I.	Shadow	Egress	16	21	19		II.	Transit	Ingress	24	4 41
I.	Transit	Egress	16	22	4		II.	Shadow	Egress	24	5 54
II.	Shadow	Ingress	17	0	25		II.	Transit	Egress	24	7 33
II.	Transit	Ingress	17	1	54		I.	Eclipse	Disapp.	24	18 14 44.0
II.	Shadow	Egress	17	3	18		I.	Occult.	Reapp.	24	21 22
II.	Transit	Egress	17	4	47		I.	Shadow	Ingress	25	15 22
I.	Eclipse	Disapp. W.	17	16	20 59.5		I.	Transit	Ingress W.	25	16 14
I.	Occult.	Reapp.	17	19	23		I.	Shadow	Egress W.	25	17 41
I.	Shadow	Ingress	18	13	28		I.	Transit	Egress	25	18 32
I.	Transit	Ingress	18	14	15		II.	Eclipse	Disapp.	25	21 19 5.8
I.	Shadow	Egress	18	15	47		II.	Occult.	Reapp.	26	1 52
I.	Transit	Egress W.	18	16	34		III.	Eclipse	Disapp.	26	10 10 9.6
II.	Eclipse	Disapp.	18	18	45 35.2		I.	Eclipse	Disapp.	26	12 43 5.4
II.	Occult.	Reapp.	18	23	7		III.	Eclipse	Reapp.	26	13 31 34.6
III.	Eclipse	Disapp.	19	6	11 35.6		III.	Occult.	Disapp.	26	13 38
I.	Eclipse	Disapp.	19	10	49 22.3		I.	Occult.	Reapp. W.	26	15 52
III.	Occult.	Reapp.	19	12	48		III.	Occult.	Reapp. W.	26	17 7
I.	Occult.	Reapp.	19	13	52		I.	Shadow	Ingress	27	9 50
I.	Shadow	Ingress	20	7	57		I.	Transit	Ingress	27	10 44
I.	Transit	Ingress	20	8	45		I.	Shadow	Egress	27	12 9
I.	Shadow	Egress	20	10	16		I.	Transit	Egress	27	13 2
I.	Transit	Egress	20	11	4		II.	Shadow	Ingress W.	27	16 18
II.	Shadow	Ingress	20	13	43		II.	Transit	Ingress W.	27	18 5
II.	Transit	Ingress	20	15	18		II.	Shadow	Egress	27	19 12
II.	Shadow	Egress W.	20	16	36		II.	Transit	Egress	27	20 57
II.	Transit	Egress	20	18	11		I.	Eclipse	Disapp.	28	7 11 32.3
I.	Eclipse	Disapp.	21	5	17 51.1		I.	Occult.	Reapp.	28	10 21
I.	Occult.	Reapp.	21	8	22		I.	Shadow	Ingress	29	4 18
I.	Shadow	Ingress	22	2	25		I.	Transit	Ingress	29	5 13
I.	Transit	Ingress	22	3	15		I.	Shadow	Egress	29	6 37
I.	Shadow	Egress	22	4	44		I.	Transit	Egress	29	7 31
I.	Transit	Egress	22	5	33		II.	Eclipse	Disapp.	29	10 35 49.8
II.	Eclipse	Disapp.	22	8	2 19.1		II.	Occult.	Reapp.	29	15 13
II.	Occult.	Reapp.	22	12	30		III.	Shadow	Ingress	29	23 49
III.	Shadow	Ingress	22	19	52		I.	Eclipse	Disapp.	30	1 39 54.6
III.	Transit	Ingress	22	23	13		III.	Shadow	Egress	30	3 21
III.	Shadow	Egress	22	23	24		III.	Transit	Ingress	30	3 33
I.	Eclipse	Disapp.	22	23	46 14.7		I.	Occult.	Reapp.	30	4 51
III.	Transit	Egress	23	2	43		III.	Transit	Egress	30	7 1
I.	Occult.	Reapp.	23	2	52		I.	Shadow	Ingress	30	22 47
IV.	Shadow	Ingress W.	23	16	26		I.	Transit	Ingress	30	23 43
IV.	Shadow	Egress	23	20	40		I.	Shadow	Egress	31	1 6
I.	Shadow	Ingress	23	20	53		I.	Transit	Egress	31	2 1
I.	Transit	Ingress	23	21	44		II.	Shadow	Ingress	31	5 36
I.	Shadow	Egress	23	23	12		II.	Transit	Ingress	31	7 27

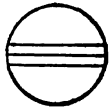
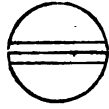
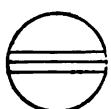

JUPITER'S SATELLITES, 1861. 455

WASHINGTON MEAN TIME.

OCTOBER.

II. Shadow	Egress	d ^d h ^h m ^m	I. Eclipse	Disapp.	d ^d h ^h m ^m s ^s
II. Transit	Egress	31 8 29	I. Occult.	Reapp.	31 20 8 22.3
		31 10 19			31 23 21

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	d *		III.	d *	
II.	d *		IV.	d * r *	

NOVEMBER.

IV. Eclipse	Disapp.	d ^d h ^h m ^m s ^s	I. Transit	Ingress	d ^d h ^h m ^m s ^s
IV. Eclipse	Reapp.	1 3 19 36.1	I. Shadow	Egress	5 7 11
IV. Occult.	Disapp.	1 7 16 39.1	I. Transit	Egress	5 8 31
IV. Occult.	Reapp. W.	1 12 16	I. Transit	Egress	5 9 29
I. Shadow	Ingress W.	1 16 13	II. Eclipse	Disapp.	5 13 9 23.5
I. Transit	Ingress W.	1 17 15	II. Occult.	Reapp. W.	5 17 56
I. Shadow	Egress	1 18 12	I. Eclipse	Disapp.	6 3 33 29.3
I. Shadow	Egress	1 19 34	III. Shadow	Ingress	6 3 47
I. Transit	Egress	1 20 30	I. Occult.	Reapp.	6 6 49
II. Eclipse	Disapp.	1 23 52 39.0	III. Shadow	Egress	6 7 18
II. Occult.	Reapp.	2 4 35	III. Transit	Ingress	6 7 51
III. Eclipse	Disapp.	2 14 8 0.7	III. Transit	Egress	6 11 18
I. Eclipse	Disapp.	2 14 36 42.5	I. Shadow	Ingress	7 0 40
III. Eclipse	Reapp. W.	2 17 28 50.7	I. Transit	Ingress	7 1 41
I. Occult.	Reapp. W.	2 17 50	I. Shadow	Egress	7 2 59
III. Occult.	Disapp. W.	2 17 57	I. Transit	Egress	7 3 59
III. Occult.	Reapp.	2 21 25	II. Shadow	Ingress	7 8 11
I. Shadow	Ingress	3 11 43	II. Transit	Ingress	7 10 12
I. Transit	Ingress	3 12 42	II. Shadow	Egress	7 11 4
I. Shadow	Egress	3 14 2	II. Transit	Egress	7 13 4
I. Transit	Egress	3 15 0	I. Eclipse	Disapp.	7 22 1 55.8
II. Shadow	Ingress	3 18 54	I. Occult.	Reapp.	8 1 19
II. Transit	Ingress	3 20 50	I. Shadow	Ingress	8 19 8
II. Shadow	Egress	3 21 47	I. Transit	Ingress	8 20 10
II. Transit	Egress	3 23 42	I. Shadow	Egress	8 21 27
I. Eclipse	Disapp.	4 9 5 8.0	I. Transit	Egress	8 22 28
I. Occult.	Reapp.	4 12 20	II. Eclipse	Disapp.	9 2 26 16.2
I. Shadow	Ingress	5 6 12	II. Occult.	Reapp.	9 7 18

456 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

NOVEMBER.

			d	h	m	s				d	h	m	s
IV.	Shadow	Ingress	9	10	24		I.	Occult.	Reapp.	16	21	45	
IV.	Shadow	Egress	9	14	32		III.	Eclipse	Disapp.	16	22	3	8.2
I.	Eclipse	Disapp. W.	9	16	30	14.9	III.	Eclipse	Reapp.	17	1	22	46.2
III.	Eclipse	Disapp. W.	9	18	5	39.4	III.	Occult.	Disapp.	17	2	28	
I.	Occult.	Reapp.	9	19	48		III.	Occult.	Reapp.	17	5	52	
IV.	Transit	Ingress	9	20	17		I.	Shadow	Ingress W.	17	15	30	
III.	Eclipse	Reapp.	9	21	25	53.8	I.	Transit	Ingress W.	17	16	37	
III.	Occult.	Disapp.	9	22	14		I.	Shadow	Egress W.	17	17	49	
IV.	Transit	Egress	10	0	6		I.	Transit	Egress	17	18	54	
III.	Occult.	Reapp.	10	1	40		IV.	Eclipse	Disapp.	17	21	18	42.2
I.	Shadow	Ingress	10	13	37		II.	Shadow	Ingress	18	0	3	
I.	Transit	Ingress W.	10	14	40		IV.	Eclipse	Reapp.	18	1	10	3.4
I.	Shadow	Egress W.	10	15	56		II.	Transit	Ingress	18	2	17	
I.	Transit	Egress W.	10	16	58		II.	Shadow	Egress	18	2	56	
II.	Shadow	Ingress	10	21	30		II.	Transit	Egress	18	5	8	
II.	Transit	Ingress	10	23	34		IV.	Occult.	Disapp.	18	7	55	
II.	Shadow	Egress	11	0	23		IV.	Occult.	Reapp.	18	11	35	
II.	Transit	Egress	11	2	25		I.	Eclipse	Disapp.	18	12	52	5.5
I.	Eclipse	Disapp.	11	10	58	39.2	I.	Occult.	Reapp. W.	18	16	15	
I.	Occult.	Reapp.	11	14	18		I.	Shadow	Ingress	19	9	58	
I.	Shadow	Ingress	12	8	5		I.	Transit	Ingress	19	11	6	
I.	Transit	Ingress	12	9	9		I.	Shadow	Egress	19	12	17	
I.	Shadow	Egress	12	10	24		I.	Transit	Egress	19	13	23	
I.	Transit	Egress	12	11	27		II.	Eclipse	Disapp. W.	19	18	16	44.8
II.	Eclipse	Disapp. W.	12	15	43	1.7	II.	Occult.	Reapp.	19	23	20	
II.	Occult.	Reapp.	12	20	39		I.	Eclipse	Disapp.	20	7	20	24.2
I.	Eclipse	Disapp.	13	5	26	59.1	I.	Occult.	Reapp.	20	10	44	
III.	Shadow	Ingress	13	7	45		III.	Shadow	Ingress	20	11	43	
I.	Occult.	Reapp.	13	8	47		III.	Shadow	Egress W.	20	15	13	
III.	Shadow	Egress	13	11	16		III.	Transit	Ingress W.	20	16	20	
III.	Transit	Ingress	13	12	7		III.	Transit	Egress	20	19	43	
III.	Transit	Egress W.	13	15	32		I.	Shadow	Ingress	21	4	27	
I.	Shadow	Ingress	14	2	33		I.	Transit	Ingress	21	5	35	
I.	Transit	Ingress	14	3	38		I.	Shadow	Egress	21	6	46	
I.	Shadow	Egress	14	4	52		I.	Transit	Egress	21	7	52	
I.	Transit	Egress	14	5	56		II.	Shadow	Ingress	21	13	20	
II.	Shadow	Ingress	14	10	46		II.	Transit	Ingress W.	21	15	38	
II.	Transit	Ingress	14	12	55		II.	Shadow	Egress W.	21	16	13	
II.	Shadow	Egress	14	13	39		II.	Transit	Egress W.	21	18	28	
II.	Transit	Egress W.	14	15	46		I.	Eclipse	Disapp.	22	1	48	48.2
I.	Eclipse	Disapp.	14	23	55	24.3	I.	Occult.	Reapp.	22	5	13	
I.	Occult.	Reapp.	15	3	16		I.	Shadow	Ingress	22	22	55	
I.	Shadow	Ingress	15	21	2		I.	Transit	Ingress	23	0	4	
I.	Transit	Ingress	15	22	8		I.	Shadow	Egress	23	1	14	
I.	Shadow	Egress	15	23	21		I.	Transit	Egress	23	2	21	
I.	Transit	Egress	16	0	25		II.	Eclipse	Disapp.	23	7	33	45.8
II.	Eclipse	Disapp.	16	4	59	58.2	II.	Occult.	Reapp.	23	12	40	
II.	Occult.	Reapp.	16	10	0		I.	Eclipse	Disapp.	23	20	17	5.1
I.	Eclipse	Disapp. W.	16	18	23	42.4	I.	Occult.	Reapp.	23	23	42	

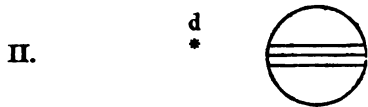
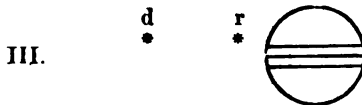
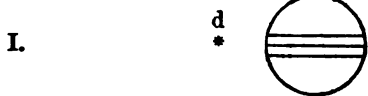
JUPITER'S SATELLITES, 1861. 457

WASHINGTON MEAN TIME.

NOVEMBER.

III.	Eclipse	Disapp.	d	h	m	s	I.	Eclipse	Disapp.	d	h	m	s
III.	Eclipse	Reapp.	24	2	0	39.9	I.	Occult.	Reapp.	27	9	13	44.2
III.	Occult.	Disapp.	24	6	39		III.	Shadow	Ingress W.	27	15	41	
III.	Occult.	Reapp.	24	10	1		III.	Shadow	Egress	27	19	10	
I.	Shadow	Ingress W.	24	17	23		III.	Transit	Ingress	27	20	30	
I.	Transit	Ingress W.	24	18	33		III.	Transit	Egress	27	23	51	
I.	Shadow	Egress	24	19	42		I.	Shadow	Ingress	28	6	20	
I.	Transit	Egress	24	20	50		I.	Transit	Ingress	28	7	31	
II.	Shadow	Ingress	25	2	38		I.	Shadow	Egress	28	8	39	
II.	Transit	Ingress	25	4	58		I.	Transit	Egress	28	9	48	
II.	Shadow	Egress	25	5	31		II.	Shadow	Ingress W.	28	15	55	
II.	Transit	Egress	25	7	48		II.	Transit	Ingress W.	28	18	18	
I.	Eclipse	Disapp. W.	25	14	45	26.7	II.	Shadow	Egress	28	18	48	
I.	Occult.	Reapp. W.	25	18	11		II.	Transit	Egress	28	21	8	
IV.	Shadow	Ingress	26	4	22		I.	Eclipse	Disapp.	29	3	42	7.0
IV.	Shadow	Egress	26	8	26		I.	Occult.	Reapp.	29	7	9	
I.	Shadow	Ingress	26	11	52		I.	Shadow	Ingress	30	0	48	
I.	Transit	Ingress	26	13	2		I.	Transit	Ingress	30	2	0	
I.	Shadow	Egress W.	26	14	11		I.	Shadow	Egress	30	3	7	
I.	Transit	Egress W.	26	15	19		I.	Transit	Egress	30	4	17	
IV.	Transit	Ingress W.	26	15	38		II.	Eclipse	Disapp.	30	10	7	40.0
IV.	Transit	Egress	26	19	9		II.	Occult.	Reapp. W.	30	15	19	
II.	Eclipse	Disapp.	26	20	50	33.8	I.	Eclipse	Disapp.	30	22	10	23.0
II.	Occult.	Reapp.	27	1	59								

Phases of the Eclipses of the Satellites for an Inverting Telescope.



DECEMBER.

I. Occult.	Reapp.	d	h	m	s		I. Shadow	Ingress	d	h	m
III. Eclipse	Disapp.	1	1	38			I. Transit	Ingress	1	20	29
III. Eclipse	Reapp.	1	9	17	5.4		I. Shadow	Egress	1	21	36
III. Occult.	Disapp.	1	10	48			I. Transit	Egress	1	22	46
III. Occult.	Reapp. W.	1	14	8			II. Shadow	Ingress	2	5	12

458 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

DECEMBER.

		d	h	m	s			d	h	m	s
II.	Transit	Ingress	2	7	38	II.	Shadow	Egress	9	10	39
II.	Shadow	Egress	2	8	5	II.	Transit	Egress W.	9	13	5
II.	Transit	Egress	2	10	28	I.	Eclipse	Disapp. W.	9	18	31 57.2
I.	Eclipse	Disapp. W.	2	16	38 43.5	I.	Occult.	Reapp.	9	22	1
I.	Occult.	Reapp.	2	20	6	I.	Shadow	Ingress W.	10	15	38
I.	Shadow	Ingress W.	3	13	45	I.	Transit	Ingress W.	10	16	52
I.	Transit	Ingress W.	3	14	58	I.	Shadow	Egress W.	10	17	57
I.	Shadow	Egress W.	3	16	4	I.	Transit	Egress	10	19	9
I.	Transit	Egress W.	3	17	15	II.	Eclipse	Disapp.	11	1	58 33.1
II.	Eclipse	Disapp.	3	23	24 29.7	II.	Occult.	Reapp.	11	7	14
II.	Occult.	Reapp.	4	4	38	I.	Eclipse	Disapp. W.	11	13	0 13.2
I.	Eclipse	Disapp.	4	11	7 0.3	I.	Occult.	Reapp. W.	11	16	30
I.	Occult.	Reapp. W.	4	14	35	III.	Shadow	Ingress	11	23	35
IV.	Eclipse	Disapp. W.	4	15	17 5.7	III.	Shadow	Egress	12	3	3
IV.	Eclipse	Reapp.	4	19	2 25.5	III.	Transit	Ingress	12	4	39
III.	Shadow	Ingress	4	19	38	III.	Transit	Egress	12	7	56
III.	Shadow	Egress	4	23	7	I.	Shadow	Ingress	12	10	7
III.	Transit	Ingress	5	0	36	I.	Transit	Ingress	12	11	20
IV.	Occult.	Disapp.	5	2	58	I.	Shadow	Egress	12	12	25
III.	Transit	Egress	5	3	56	I.	Transit	Egress W.	12	13	37
IV.	Occult.	Reapp.	5	6	18	II.	Shadow	Ingress	12	21	4
I.	Shadow	Ingress	5	8	13	IV.	Shadow	Ingress	12	22	20
I.	Transit	Ingress	5	9	26	II.	Transit	Ingress	12	23	34
I.	Shadow	Egress	5	10	32	II.	Shadow	Egress	12	23	56
I.	Transit	Egress	5	11	43	IV.	Shadow	Egress	13	2	18
II.	Shadow	Ingress W.	5	18	30	II.	Transit	Egress	13	2	22
II.	Transit	Ingress	5	20	57	I.	Eclipse	Disapp.	13	7	28 34.6
II.	Shadow	Egress	5	21	22	IV.	Transit	Ingress	13	10	19
II.	Transit	Egress	5	23	46	I.	Occult.	Reapp.	13	10	58
I.	Eclipse	Disapp.	6	5	35 22.2	IV.	Transit	Egress W.	13	13	28
I.	Occult.	Reapp.	6	9	4	I.	Shadow	Ingress	14	4	35
I.	Shadow	Ingress	7	2	42	I.	Transit	Ingress	14	5	49
I.	Transit	Ingress	7	3	55	I.	Shadow	Egress	14	6	53
I.	Shadow	Egress	7	5	0	I.	Transit	Egress	14	8	6
I.	Transit	Egress	7	6	12	II.	Eclipse	Disapp. W.	14	15	15 51.0
II.	Eclipse	Disapp.	7	12	41 41.5	II.	Occult.	Reapp.	14	20	32
II.	Occult.	Reapp. W.	7	17	56	I.	Eclipse	Disapp.	15	1	56 49.5
I.	Eclipse	Disapp.	8	0	3 37.8	I.	Occult.	Reapp.	15	5	26
I.	Occult.	Reapp.	8	3	33	III.	Eclipse	Disapp. W.	15	13	54 29.8
III.	Eclipse	Disapp.	8	9	56 24.9	III.	Eclipse	Reapp. W.	15	17	11 35.2
III.	Eclipse	Reapp. W.	8	13	14 9.3	III.	Occult.	Disapp.	15	18	55
III.	Occult.	Disapp. W.	8	14	53	III.	Occult.	Reapp.	15	22	11
III.	Occult.	Reapp. W.	8	18	11	I.	Shadow	Ingress	15	23	3
I.	Shadow	Ingress	8	21	10	I.	Transit	Ingress	16	0	17
I.	Transit	Ingress	8	22	23	I.	Shadow	Egress	16	1	21
I.	Shadow	Egress	8	23	29	I.	Transit	Egress	16	2	34
I.	Transit	Egress	9	0	40	II.	Shadow	Ingress	16	10	21
II.	Shadow	Ingress	9	7	47	II.	Transit	Ingress W.	16	12	52
II.	Transit	Ingress	9	10	16	II.	Shadow	Egress W.	16	13	13

JUPITER'S SATELLITES, 1861. 459

WASHINGTON MEAN TIME.

DECEMBER.

				d	h	m	s					d	h	m	s
II.	Transit	Egress	W.	16	15	40		I.	Eclipse	Disapp.		23	22	18	17.0
I.	Eclipse	Disapp.		16	20	25	8.4	I.	Occult.	Reapp.		24	1	47	
I.	Occult.	Reapp.		16	23	55		I.	Shadow	Ingress		24	19	24	
I.	Shadow	Ingress	W.	17	17	32		I.	Transit	Ingress		24	20	38	
I.	Transit	Ingress		17	18	46		I.	Shadow	Egress		24	21	42	
I.	Shadow	Egress		17	19	50		I.	Transit	Egress		24	22	55	
I.	Transit	Egress		17	21	3		II.	Eclipse	Disapp.		25	7	7	5.7
II.	Eclipse	Disapp.		18	4	32	44.9	II.	Occult.	Reapp.	W.	25	12	22	
II.	Occult.	Reapp.		18	9	49		I.	Eclipse	Disapp.	W.	25	16	46	32.1
I.	Eclipse	Disapp.	W.	18	14	53	23.8	I.	Occult.	Reapp.		25	20	15	
I.	Occult.	Reapp.	W.	18	18	23		III.	Shadow	Ingress		26	7	30	
III.	Shadow	Ingress		19	3	32		III.	Shadow	Egress		26	10	57	
III.	Shadow	Egress		19	7	0		III.	Transit	Ingress	W.	26	12	32	
III.	Transit	Ingress		19	8	37		I.	Shadow	Ingress	W.	26	13	52	
III.	Transit	Egress		19	11	53		I.	Transit	Ingress	W.	26	15	6	
I.	Shadow	Ingress		19	12	0		III.	Transit	Egress	W.	26	15	47	
I.	Transit	Ingress	W.	19	13	14		I.	Shadow	Egress	W.	26	16	10	
I.	Shadow	Egress	W.	19	14	18		I.	Transit	Egress	W.	26	17	23	
I.	Transit	Egress	W.	19	15	31		II.	Shadow	Ingress		27	2	11	
II.	Shadow	Ingress		19	23	38		II.	Transit	Ingress		27	4	41	
II.	Transit	Ingress		20	2	10		II.	Shadow	Egress		27	5	3	
II.	Shadow	Egress		20	2	30		II.	Transit	Egress		27	7	28	
II.	Transit	Egress		20	4	57		I.	Eclipse	Disapp.		27	11	14	52.0
I.	Eclipse	Disapp.		20	9	21	44.1	I.	Occult.	Reapp.	W.	27	14	43	
I.	Occult.	Reapp.	W.	20	12	51		I.	Shadow	Ingress		28	8	21	
I.	Shadow	Ingress		21	6	28		I.	Transit	Ingress		28	9	34	
I.	Transit	Ingress		21	7	42		I.	Shadow	Egress		28	10	39	
I.	Shadow	Egress		21	8	46		I.	Transit	Egress		28	11	51	
IV.	Eclipse	Disapp.		21	9	15	27.1	II.	Eclipse	Disapp.		28	20	24	37.1
I.	Transit	Egress		21	9	59		II.	Occult.	Reapp.		29	1	38	
IV.	Eclipse	Reapp.	W.	21	12	54	24.7	I.	Eclipse	Disapp.		29	5	43	6.9
II.	Eclipse	Disapp.	W.	21	17	50	9.3	I.	Occult.	Reapp.		29	9	11	
IV.	Occult.	Disapp.		21	21	16		IV.	Shadow	Ingress	W.	29	16	19	
II.	Occult.	Reapp.		21	23	6		IV.	Shadow	Egress		29	20	10	
IV.	Occult.	Reapp.		22	0	13		III.	Eclipse	Disapp.		29	21	49	14.2
I.	Eclipse	Disapp.		22	3	49	58.8	III.	Eclipse	Reapp.		30	1	4	59.6
I.	Occult.	Reapp.		22	7	19		III.	Occult.	Disapp.		30	2	43	
III.	Eclipse	Disapp.	W.	22	17	51	56.2	I.	Shadow	Ingress		30	2	49	
III.	Eclipse	Reapp.		22	21	8	21.8	I.	Transit	Ingress		30	4	2	
III.	Occult.	Disapp.		22	22	51		IV.	Transit	Ingress		30	4	10	
I.	Shadow	Ingress		23	0	56		I.	Shadow	Egress		30	5	7	
III.	Occult.	Reapp.		23	2	6		III.	Occult.	Reapp.		30	5	56	
I.	Transit	Ingress		23	2	10		I.	Transit	Egress		30	6	19	
I.	Shadow	Egress		23	3	14		IV.	Transit	Egress		30	6	54	
I.	Transit	Egress		23	4	27		II.	Shadow	Ingress	W.	30	15	28	
II.	Shadow	Ingress	W.	23	12	55		II.	Transit	Ingress	W.	30	17	57	
II.	Transit	Ingress	W.	23	15	25		II.	Shadow	Egress	W.	30	18	20	
II.	Shadow	Egress	W.	23	15	47		II.	Transit	Egress		30	20	44	
II.	Transit	Egress	W.	23	18	13		I.	Eclipse	Disapp.		31	0	11	24.9

JUPITER'S SATELLITES, 1861. 461

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

Jan. 2	h m 6 35.1	March 19	h m 7 17.2	June 3	h m 9 31.8	Oct. 17	h m 18 13.5
4	1 1.5	21	1 44.0	5	4 1.4	19	12 43.4
5	19 27.9	22	20 10.7	6	22 30.9	21	7 13.3
7	13 54.2	24	14 37.8	8	17 0.6	23	1 43.1
9	8 20.6	26	9 4.8	10	11 30.3	24	20 12.9
11	2 47.0	28	3 32.8	12	6 0.0	26	14 42.6
12	21 12.9	29	21 59.0	14	0 29.7	28	9 12.3
14	15 39.1	31	16 26.1	15	18 59.5	30	3 42.0
16	10 5.2	April 2	10 53.4	17	13 29.2	31	22 11.6
18	4 31.3	4	5 20.8	19	7 59.2	Nov. 2	16 41.1
19	22 57.2	5	23 48.3	21	2 29.0	4	11 10.8
21	17 23.2	7	18 15.8	22	20 58.9	6	5 40.2
23	11 49.2	9	12 43.4	24	15 28.8	8	0 9.7
25	6 15.1	11	7 11.0	26	9 58.8	9	18 39.1
27	0 41.0	13	1 38.9	28	4 28.7	11	13 8.5
28	19 6.7	14	20 6.6	29	22 58.8	13	7 37.8
30	13 32.6	16	14 34.6	July 1	17 28.8	15	2 7.2
Feb. 1	7 58.4	18	9 2.5	3	11 58.9	16	20 36.4
3	2 24.2	20	3 30.6	5	6 28.9	18	15 5.7
4	20 50.0	21	21 58.7	7	0 59.0	20	9 34.8
6	15 15.8	23	16 36.8	8	19 29.1	22	4 4.0
8	9 41.5	25	10 55.0	10	13 59.2	23	22 33.0
10	4 7.3	27	5 23.4	12	8 29.4	25	17 2.0
11	22 33.1	28	23 51.7	14	2 59.7	27	11 31.0
13	16 59.0	30	18 20.2	15	21 29.9	29	5 59.9
15	11 24.9	May 2	12 48.6	17	16 0.2	Dec. 1	0 28.7
17	5 40.8	4	7 17.2	19	10 30.4	2	18 57.5
19	0 16.7	6	1 45.9	21	5 0.7	4	13 26.3
20	18 42.7	7	20 14.6	22	23 31.0	6	7 55.0
22	13 8.8	9	14 43.3	24	18 1.3	8	2 23.6
24	7 34.8	11	9 12.2	26	12 31.5	9	20 52.2
26	2 0.8	13	3 41.1	28	7 1.9	11	15 20.7
27	20 26.8	14	22 10.1	30	1 32.2	13	9 49.2
March 1	14 53.0	16	16 39.0	31	20 2.6	15	4 17.5
3	9 19.2	18	11 8.2	Oct. 1	19 43.4	16	22 45.9
5	3 45.3	20	5 37.2	3	14 13.6	18	17 14.2
6	22 11.6	22	0 6.4	5	8 43.6	20	11 42.4
8	16 37.9	23	18 35.5	7	3 13.7	22	6 10.4
10	11 4.3	25	13 4.9	8	21 43.6	24	0 38.5
12	5 30.7	27	7 34.1	10	16 13.8	25	19 6.5
13	23 57.2	29	2 3.5	12	10 43.6	27	13 34.5
15	18 23.9	30	20 32.8	14	5 13.6	29	8 2.3
17	12 50.5	June 1	15 2.4	15	23 43.5	31	2 30.1

SATELLITE II.

Jan. 4	h m 0 59.6	Jan. 28	h m 21 1.5	Feb. 22	h m 16 55.9	March 19	h m 13 0.5
7	14 9.2	Feb. 1	10 9.8	26	6 3.6	23	2 12.1
11	3 19.4	4	23 16.8	March 1	19 12.5	26	15 23.3
14	16 28.2	8	12 24.9	5	8 20.9	30	4 35.9
18	5 37.6	12	1 32.0	8	21 30.6	April 2	17 48.2
21	18 45.5	15	14 40.2	12	10 39.8	6	7 1.8
25	7 54.2	19	3 47.5	15	23 50.3	9	20 15.1

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WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

April 13	^h 9 ^m 29.9	June 5	^h 17 ^m 2.8	July 25	^h 12 ^m 16.7	Nov. 12	^h 19 ^m 13.2
16	22 44.6	9	6 23.8	29	1 40.7	16	8 34.2
20	12 0.3	12	19 45.2	Oct. 1	2 46.4	19	21 54.5
24	1 16.1	16	9 6.9	4	16 9.6	23	11 14.8
27	14 32.8	19	22 28.8	8	5 32.7	27	0 34.5
May 1	3 49.5	23	11 50.9	11	18 55.6	30	13 54.2
4	17 7.2	27	1 13.3	15	8 18.4	Dec. 4	3 13.1
8	6 25.0	30	14 35.8	18	21 40.9	7	16 32.0
11	19 43.6	July 4	3 58.5	22	11 3.3	11	5 50.0
15	9 2.3	7	17 21.3	26	0 25.6	14	19 8.0
18	22 21.6	11	6 44.3	29	13 47.5	18	8 25.1
22	11 41.0	14	20 7.3	Nov. 2	3 9.3	21	21 42.2
26	1 1.0	18	9 30.5	5	16 30.8	25	10 58.3
29	14 21.2	21	22 53.8	9	5 52.2	29	0 14.5
June 2	3 41.8						

SATELLITE III.

Jan. 5	^h 19 ^m 54.9	March 25	^h 8 ^m 36.3	June 12	^h 3 ^m 46.3	Oct. 26	^h 15 ^m 22.6
12	23 18.6	April 1	12 10.4	19	8 2.0	Nov. 2	19 41.8
20	2 38.9	8	15 49.4	26	12 20.0	9	23 56.7
27	5 56.5	15	19 32.8	July 3	16 40.5	17	4 9.8
Feb. 3	9 12.8	22	23 20.6	10	21 2.5	24	8 20.3
10	12 28.2	30	3 12.7	18	1 26.4	Dec. 1	12 28.1
17	15 44.4	May 7	7 9.0	25	5 51.0	8	16 32.1
24	19 1.0	14	11 9.7	Oct. 5	2 15.4	15	20 32.6
March 3	22 19.9	21	15 13.9	12	6 39.4	23	0 28.5
11	1 41.5	28	19 22.2	19	11 1.7	30	4 19.9
18	5 6.6	June 4	23 33.1				

SATELLITE IV.

Jan. 4	^h 1 ^m 16.2	March 28	^h 2 ^m 5.2	June 19	^h 19 ^m 37.7	Nov. 1	^h 14 ^m 14.4
20	16 2.4	April 13	18 15.0	July 6	15 30.9	18	9 45.2
Feb. 6	6 14.8	30	11 24.2	July 23	11 45.3	Dec. 5	4 38.2
22	20 21.4	May 17	5 25.8	Oct. 15	18 16.1	21	22 44.4
March 11	10 51.5	June 3	0 12.7				

Factors by which x' and y' in the following Table must be multiplied to obtain the coördinates x and y for any time.

p = the inclination of the northern semi-minor axis of the apparent ellipse to the circle of declination; + East, — West.

x and y at the time of the visible phase of every fourth eclipse for the Ist, of every second eclipse for the II^d, and of every eclipse for the III^d and IVth Satellites.

JUPITER'S SATELLITES, 1861. 463

SATELLITE I.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x'.	Factor for y'.	p.	z.	y.		Factor for x'.	Factor for y'.	p.	z.	y.
Jan. 2	1.133	-0.191	+22 ⁰ 1.9	-36 ^u	-1 ⁿ	June 6	0.906	-0.110	+20 ⁰ 53.2	+32 ^u	-1 ⁿ
9	1.152	0.202	21 55.6	35	1	14	0.891	0.116	21 9.0	31	1
16	1.167	0.209	21 46.9	32	1	21	0.877	0.123	21 25.5	30	1
23	1.179	0.210	21 36.2	29	1	28	0.864	0.131	21 42.5	29	1
30	1.187	0.206	21 24.1	27	1	July 5	0.853	0.140	21 59.7	27	1
Feb. 6	1.191	-0.200	+21 10.9	-24	-1	12	0.843	-0.151	+22 17.1	+26	-1
13	1.191	0.198	20 57.1	+24	1	19	0.834	0.162	22 34.3	24	1
20	1.186	0.183	20 43.1	27	1	26	0.827	0.172	22 51.2	+22	2
27	1.177	0.173	20 29.7	30	1	Oct. 1	0.825	0.310	24 52.6	-21	2
March 6	1.165	0.162	20 17.2	32	1	8	0.832	0.328	25 0.2	23	2
13	1.150	-0.150	+20 6.3	+34	-1	15	0.841	-0.348	+25 6.4	-25	-2
21	1.132	0.139	19 57.2	35	1	23	0.850	0.369	25 11.4	27	2
28	1.113	0.128	19 50.4	36	1	30	0.861	0.390	25 15.6	28	2
April 4	1.091	0.120	19 46.0	37	1	Nov. 6	0.874	0.413	25 19.1	30	2
11	1.069	0.113	19 44.3	38	1	13	0.888	0.436	25 21.9	31	3
18	1.046	-0.107	+19 45.2	+38	-1	20	0.903	-0.459	+25 24.0	-32	-3
25	1.023	0.103	19 48.7	38	1	27	0.920	0.483	25 25.5	33	3
May 2	1.001	0.101	19 54.6	38	1	Dec. 4	0.939	0.508	25 26.5	34	3
9	0.980	0.100	20 2.7	38	1	11	0.958	0.533	25 27.1	35	3
16	0.960	0.100	20 12.9	37	1	18	0.978	0.559	25 27.4	36	3
23	0.941	-0.102	+20 24.9	+35	-1	25	0.999	-0.585	+25 27.5	-37	-3
30	0.923	-0.105	+20 38.4	+34	-1						

SATELLITE II.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x'.	Factor for y'.	p.	z.	y.		Factor for x'.	Factor for y'.	p.	z.	y.
Jan. 4	1.138	-0.057	+22 ⁰ 15.5	-45 ^u	-1 ⁿ	June 9	0.901	-0.005	+21 ⁰ 12.5	+42 ^u	-0 ⁿ
11	1.156	0.058	22 7.7	42	1	16	0.886	0.013	21 29.2	40	0
18	1.170	0.059	21 58.0	38	1	23	0.872	0.022	21 46.6	38	0
25	1.181	0.058	21 46.6	33	1	30	0.860	0.032	22 4.4	35	0
Feb. 1	1.188	0.055	21 33.9	28	1	July 7	0.849	0.042	22 22.4	33	1
8	1.191	-0.048	+21 20.2	-23	-1	14	0.839	-0.053	+22 40.4	+30	-1
15	1.190	0.039	21 6.0	+26	0	21	0.831	0.064	22 58.2	28	1
22	1.184	0.030	20 51.7	31	0	29	0.825	0.076	23 15.6	+26	1
March 1	1.174	0.020	20 38.1	36	0	Oct. 1	0.825	0.208	25 15.4	-25	2
8	1.161	-0.011	29 25.7	40	0	8	0.832	0.227	25 23.4	28	3
15	1.145	-0.003	+20 15.0	+44	-0	15	0.840	-0.247	+25 30.3	-30	-3
23	1.126	+0.005	20 6.3	47	0	22	0.849	0.267	25 35.9	33	3
30	1.106	0.011	20 0.1	49	0	29	0.860	0.288	25 40.6	35	3
April 6	1.084	0.016	19 56.6	50	0	Nov. 5	0.873	0.309	25 44.6	37	4
13	1.062	0.019	19 55.7	51	0	12	0.887	0.331	25 47.8	39	4
20	1.039	+0.021	+19 57.4	+51	-0	19	0.903	-0.352	+25 50.1	-41	-4
27	1.016	0.022	20 1.9	51	0	27	0.920	0.376	25 51.8	43	4
May 4	0.994	0.021	20 8.9	50	0	Dec. 4	0.938	0.399	25 52.9	45	5
11	0.973	0.018	20 18.1	49	0	11	0.957	0.422	25 53.7	47	5
18	0.953	0.014	20 29.3	47	0	18	0.977	0.445	25 54.2	48	5
26	0.935	+0.009	+20 42.3	+46	-0	25	0.999	-0.468	+25 54.4	-49	-5
June 2	0.917	+0.002	+20 56.7	+44	-0						

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SATELLITE III.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for z' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				z .	y .	z .	y .
Jan. 5	1.143	-0.140	+21 49.9	- 57	- 2	..	..
12	1.160	0.144	21 48.3	52	2	..	..
20	1.173	0.145	21 34.0	45	2	..	..
27	1.183	0.143	21 22.3	38	2	..	..
Feb. 3	1.189	0.139	21 9.3	- 30	- 2	..	..
10	1.191	-0.133	+20 55.5	..	..	..	..
17	1.189	0.126	20 41.2	..	..	+ 29	- 2
24	1.182	0.117	20 27.1	..	..	38	2
March 3	1.170	0.107	20 13.9	..	..	46	2
11	1.156	0.097	20 1.9	..	..	53	2
18	1.140	-0.088	+19 51.9	..	..	+ 58	- 2
25	1.120	0.079	19 44.0	+ 23	- 1	62	1
April 1	1.098	0.070	19 38.6	27	1	65	1
8	1.076	0.063	19 35.8	30	1	67	1
15	1.054	0.058	19 35.8	32	1	69	1
22	1.031	-0.055	+19 38.5	+ 33	- 1	+ 70	- 1
30	1.009	0.053	19 43.6	34	1	70	1
May 7	0.987	0.052	19 51.2	34	1	69	1
14	0.966	0.053	20 1.0	33	1	67	1
21	0.946	0.055	20 12.7	32	1	65	1
28	0.928	-0.058	+20 26.1	+ 30	- 1	+ 62	- 1
June 4	0.911	0.062	20 40.9	28	1	59	1
12	0.895	0.067	20 56.8	25	1	56	1
19	0.880	0.074	21 13.7	22	1	53	1
26	0.867	0.081	21 31.0	+ 19	1	49	1
July 3	0.855	-0.089	+21 48.6	..	..	+ 46	- 1
10	0.845	0.098	22 6.5	..	..	42	2
18	0.836	0.108	22 24.3	..	..	38	2
25	0.828	0.118	22 41.7	..	..	34	2
Oct. 5	0.825	0.257	24 53.0	- 33	- 4	..	..
12	0.835	-0.276	+25 0.0	- 37	- 5	..	..
19	0.845	0.295	25 6.2	41	5	..	..
26	0.856	0.315	25 11.7	45	5	- 16	- 5
Nov. 2	0.868	0.333	25 16.2	49	6	19	6
9	0.882	0.356	25 19.6	52	6	22	6
17	0.897	-0.378	+25 22.1	- 55	- 6	- 25	- 7
24	0.913	0.400	25 23.9	58	7	28	7
Dec. 1	0.931	0.423	25 25.3	61	7	30	7
8	0.950	0.446	25 26.1	63	8	32	8
15	0.970	0.470	25 26.7	65	8	33	8
23	0.991	-0.494	+25 27.1	- 66	- 8	- 33	- 9
30	1.013	-0.518	+25 27.2	- 66	- 9	- 33	- 9

JUPITER'S SATELLITES, 1861. 465

SATELLITE IV.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				x .	y .	x .	y .
Jan. 4	1.139	-0.115	+21 ⁰ 47.0	- 89 ["]	- 4 ["]	- 48 ["]	- 4 ["]
20	1.174	0.121	21 25.9	63	4	..	..
Feb. 6	1.191	0.116	20 56.4	- 30	4	..	..
22	1.184	0.102	20 23.5	..	..	+ 48	3
March 11	1.155	0.083	19 54.0	+ 36	3	77	3
28	1.113	-0.065	+19 34.2	+ 59	- 2	+ 98	- 2
April 13	1.060	0.052	19 28.0	71	2	108	2
30	1.008	0.045	19 36.4	74	1	109	1
May 17	0.956	0.045	19 57.8	71	1	104	1
June 3	0.915	0.051	20 29.3	63	2	94	2
19	0.879	-0.062	+21 7.4	+ 51	- 2	+ 81	- 2
July 6	0.851	0.077	21 48.6	37	3	66	3
23	0.830	0.096	22 27.4	+ 23	3	+ 50	3
Oct. 15	0.841	0.338	24 57.0	- 57	8	- 31	8
Nov. 1	0.866	0.277	25 9.1	72	9	46	9
18	0.899	-0.319	+25 16.6	- 85	-11	- 59	-11
Dec. 5	0.941	0.364	25 20.5	95	12	68	12
21	0.988	-0.412	+25 21.2	-101	-14	- 75	-14

SATELLITE I.

COORDINATES IN THE MEAN APPARENT ELLIPSE, DESCRIBED BY THE
SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER
FROM THE SUN, FOR THE TIME (t) AFTER GEO-
CENTRIC SUPERIOR CONJUNCTION.

t	x'	y'	t	x'	y'	t	x'	y'
d h m	$^{\circ}$	$^{\circ}$	d h m	$^{\circ}$	$^{\circ}$	d h m	$^{\circ}$	$^{\circ}$
0 0 0	+ 0.0	+ 6.6	0 5 20	+ 77.5	+ 4.7	0 10 40	+109.1	- 0.1
0 0 30	5.4	6.6	0 5 40	81.3	4.4	0 11 0	109.0	0.4
0 0 40	10.8	6.6	0 6 0	84.7	4.2	0 11 20	108.6	0.7
0 1 0	16.1	6.6	0 6 20	88.0	3.9	0 11 40	107.9	1.0
0 1 20	21.4	6.5	0 6 40	91.1	3.7	0 12 0	106.9	1.3
0 1 40	+ 26.6	+ 6.4	0 7 0	+ 94.0	+ 3.4	0 12 20	+105.7	- 1.7
0 2 0	31.8	6.3	0 7 20	96.6	3.1	0 12 40	104.2	2.0
0 2 20	36.9	6.2	0 7 40	99.0	2.8	0 13 0	102.5	2.3
0 2 40	42.0	6.1	0 8 0	101.1	2.5	0 13 20	100.5	2.6
0 3 0	46.9	6.0	0 8 20	103.0	2.2	0 13 40	98.3	2.9
0 3 20	+ 51.7	+ 5.8	0 8 40	+104.7	+ 1.9	0 14 0	+ 95.8	- 3.2
0 3 40	56.4	5.7	0 9 0	106.1	1.6	0 14 20	93.1	3.5
0 4 0	60.9	5.5	0 9 20	107.3	1.3	0 14 40	90.2	3.7
0 4 20	65.3	5.3	0 9 40	108.1	0.9	0 15 0	87.1	4.0
0 4 40	69.5	5.1	0 10 0	108.7	0.6	0 15 20	83.7	4.3
0 5 0	+ 73.6	+ 4.9	0 10 20	+109.1	+ 0.3	0 15 40	+ 80.1	- 4.5

466 JUPITER'S SATELLITES, 1861.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE I.

<i>t</i>	<i>x'</i>	<i>y</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
0 16 0	+ 76.4	- 4.7	1 1 40	- 66.6	- 5.2	1 11 0	- 97.6	+ 6.0
0 16 20	72.5	5.0	1 2 0	70.8	5.0	1 11 20	95.1	3.3
0 16 40	68.4	5.2	1 2 20	74.8	4.8	1 11 40	92.3	3.5
0 17 0	64.1	5.4	1 2 40	78.6	4.6	1 12 0	89.3	3.3
0 17 20	59.6	5.5	1 3 0	82.2	4.4	1 12 20	86.1	4.1
0 17 40	+ 55.0	- 5.7	1 3 20	- 85.6	- 4.1	1 12 40	- 82.7	+ 4.3
0 18 0	50.3	5.9	1 3 40	88.9	3.8	1 13 0	79.1	4.6
0 18 20	45.5	6.0	1 4 0	91.9	3.6	1 13 20	75.3	4.8
0 18 40	40.5	6.1	1 4 20	94.7	3.3	1 13 40	71.3	5.0
0 19 0	35.5	6.3	1 4 40	97.3	3.0	1 14 0	67.1	5.2
0 19 20	+ 30.4	- 6.4	1 5 0	- 99.6	- 2.7	1 14 20	- 62.8	+ 5.4
0 19 40	25.2	6.4	1 5 20	101.7	2.4	1 14 40	58.3	5.6
0 20 0	19.9	6.5	1 5 40	103.5	2.1	1 15 0	53.7	5.8
0 20 20	14.6	6.6	1 6 0	105.1	1.8	1 15 20	49.0	5.9
0 20 40	9.2	6.6	1 6 20	106.4	1.5	1 15 40	44.1	6.1
0 21 0	+ 3.8	- 6.6	1 6 40	- 107.5	- 1.2	1 16 0	- 39.1	+ 6.2
0 21 20	- 1.5	6.6	1 7 0	108.3	0.8	1 16 20	34.0	6.3
0 21 40	6.9	6.6	1 7 20	108.8	0.5	1 16 40	28.9	6.4
0 22 0	12.3	6.6	1 7 40	109.1	- 0.2	1 17 0	23.7	6.5
0 22 20	17.6	6.5	1 8 0	109.1	+ 0.1	1 17 20	18.4	6.5
0 22 40	- 22.9	- 6.5	1 8 20	- 108.9	+ 0.5	1 17 40	- 13.0	+ 6.6
0 23 0	28.1	6.4	1 8 40	108.4	0.8	1 18 0	7.7	6.6
0 23 20	33.3	6.3	1 9 0	107.6	1.1	1 18 20	- 2.3	6.6
0 23 40	38.4	6.2	1 9 20	106.6	1.4	1 18 40	+ 3.1	6.6
1 0 0	43.4	6.1	1 9 40	105.3	1.8	1 19 0	8.5	6.6
1 0 20	- 48.3	- 5.9	1 10 0	- 103.8	+ 2.1	1 19 20	+ 13.8	+ 6.6
1 0 40	53.1	5.8	1 10 20	102.0	2.4	1 19 40	19.1	6.5
1 1 0	57.7	5.6	1 10 40	- 99.9	+ 2.7	1 20 0	+ 24.4	+ 6.5
1 1 20	- 62.2	- 5.4						

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	"	"	d. h. m.	"	"	d. h. m.	"	"
0 0 0	+ 0.0	+12.2	0 10 40	+122.9	+ 8.6	0 21 20	+173.8	- 0.0
0 0 40	8.5	12.2	0 11 20	128.8	8.2	0 22 0	173.6	0.6
0 1 20	17.0	12.1	0 12 0	134.4	7.7	0 22 40	172.9	1.2
0 2 0	25.5	12.1	0 12 40	139.6	7.3	0 23 20	171.8	1.8
0 2 40	33.9	12.0	0 13 20	144.5	6.8	1 0 0	170.4	2.4
0 3 20	+ 42.2	+11.8	0 14 0	+149.0	+ 6.3	1 0 40	+168.5	- 3.0
0 4 0	50.5	11.7	0 14 40	153.2	5.7	1 1 20	166.2	3.5
0 4 40	58.6	11.5	0 15 20	157.0	5.2	1 2 0	163.5	4.1
0 5 20	66.5	11.3	0 16 0	160.5	4.7	1 2 40	160.4	4.7
0 6 0	74.3	11.0	0 16 40	163.6	4.1	1 3 20	157.0	5.2
0 6 40	+ 81.9	+10.8	0 17 20	+166.3	+ 3.5	1 4 0	+153.2	- 5.8
0 7 20	89.4	10.5	0 18 0	168.6	3.0	1 4 40	149.0	6.3
0 8 0	96.6	10.1	0 18 40	170.5	2.4	1 5 20	144.4	6.8
0 8 40	103.6	9.8	0 19 20	171.9	1.8	1 6 0	139.5	7.3
0 9 20	110.3	9.4	0 20 0	172.9	1.2	1 6 40	134.2	7.7
0 10 0	+116.7	+ 9.0	0 20 40	+173.6	+ 0.6	1 7 20	+128.6	- 8.2

JUPITER'S SATELLITES, 1861. 467

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	+	—	d. h. m.	—	—	d. h. m.	—	+
1 8 0	+122.7	— 8.6	2 3 20	—103.7	— 9.8	2 22 0	—156.9	+ 5.2
1 8 40	116.5	9.0	2 4 0	110.4	9.4	2 22 40	153.0	5.8
1 9 20	110.1	9.4	2 4 40	116.8	9.0	2 23 20	148.8	6.3
1 10 0	103.4	9.8	2 5 20	123.0	8.6	3 0 0	144.2	6.8
1 10 40	96.4	10.1	2 6 0	128.9	8.2	3 0 40	139.3	7.3
1 11 20	+ 89.2	—10.5	2 6 40	—134.5	— 7.7	3 1 20	—134.1	+ 7.8
1 12 0	81.7	10.8	2 7 20	139.7	7.2	3 2 0	128.5	8.2
1 12 40	74.1	11.0	2 8 0	144.6	6.7	3 2 40	122.6	8.6
1 13 20	66.3	11.3	2 8 40	149.1	6.2	3 3 20	116.4	9.0
1 14 0	58.3	11.5	2 9 20	153.3	5.7	3 4 0	109.9	9.4
1 14 40	+ 50.2	—11.7	2 10 0	—157.1	— 5.2	3 4 40	—103.1	+ 9.8
1 15 20	42.0	11.8	2 10 40	160.6	4.6	3 5 20	96.1	10.1
1 16 0	33.7	12.0	2 11 20	163.7	4.1	3 6 0	88.9	10.5
1 16 40	25.3	12.1	2 12 0	166.4	3.5	3 6 40	81.5	10.8
1 17 20	16.8	12.1	2 12 40	168.6	2.9	3 7 20	73.9	11.0
1 18 0	+ 8.3	—12.2	2 13 20	—170.4	— 2.3	3 8 0	— 66.1	+11.3
1 18 40	— 0.2	12.2	2 14 0	171.9	1.8	3 8 40	58.1	11.5
1 19 20	8.8	12.2	2 14 40	173.0	1.2	3 9 20	50.0	11.7
1 20 0	17.3	12.1	2 15 20	173.6	— 0.6	3 10 0	41.3	11.8
1 20 40	25.7	12.1	2 16 0	173.8	+ 0.0	3 10 40	33.5	12.0
1 21 20	— 34.1	—12.0	2 16 40	—173.6	+ 0.6	3 11 20	— 25.1	+12.1
1 22 0	42.4	11.8	2 17 20	172.9	1.2	3 12 0	16.6	12.1
1 22 40	50.6	11.7	2 18 0	171.8	1.8	3 12 40	— 8.1	12.2
1 23 20	58.7	11.5	2 18 40	170.3	2.4	3 13 20	+ 0.4	12.3
2 0 0	66.7	11.3	2 19 20	168.4	3.0	3 14 0	9.0	12.3
2 0 40	— 74.5	—11.0	2 20 0	—166.2	+ 3.5	3 14 40	+ 17.5	+12.1
2 1 20	82.1	10.7	2 20 40	163.5	4.1	3 15 20	26.0	12.1
2 2 0	89.5	10.4	2 21 20	—160.4	+ 4.7	3 16 0	+ 34.4	+12.0
2 2 40	— 96.7	—10.1						

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	+	+	d. h. m.	+	+	d. h. m.	+	+
0 0 0	+ 0.0	+17.4	0 21 20	+194.7	+12.4	1 18 40	+277.2	+ 0.2
0 1 20	13.5	17.4	0 22 40	204.1	11.8	1 20 0	277.0	— 0.6
0 2 40	26.9	17.3	1 0 0	213.0	11.1	1 21 20	276.2	1.5
0 4 0	40.3	17.2	1 1 20	221.4	10.5	1 22 40	274.7	2.3
0 5 20	53.6	17.1	1 2 40	229.3	9.8	2 0 0	272.6	3.2
0 6 40	+ 66.8	+16.9	1 4 0	+236.6	+ 9.1	2 1 20	+269.8	— 4.0
0 8 0	79.8	16.7	1 5 20	243.3	8.3	2 2 40	266.4	4.8
0 9 20	92.7	16.4	1 6 40	249.5	7.6	2 4 0	262.3	5.6
0 10 40	105.3	16.1	1 8 0	255.1	6.8	2 5 20	257.6	6.4
0 12 0	117.6	15.8	1 9 20	260.0	6.0	2 6 40	252.3	7.2
0 13 20	+129.7	+15.4	1 10 40	+264.3	+ 5.2	2 8 0	+246.4	— 8.0
0 14 40	141.5	15.0	1 12 0	268.0	4.4	2 9 20	240.0	8.7
0 16 0	153.0	14.5	1 13 20	271.1	3.6	2 10 40	233.0	9.4
0 17 20	164.1	14.0	1 14 40	273.6	2.7	2 12 0	225.4	10.1
0 18 40	174.7	13.5	1 16 0	275.5	1.9	2 13 20	217.3	10.8
0 20 0	+184.9	+13.0	1 17 20	+276.7	+ 1.1	2 14 40	+208.6	—11.5

468 JUPITER'S SATELLITES, 1861.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.			d. h. m.			d. h. m.		
2 16 0	+199.5	-12.1	4 6 40	-158.4	-14.3	5 20 0	-255.1	+ 6.8
2 17 20	189.9	12.7	4 8 0	169.3	13.8	5 21 20	249.5	7.6
2 18 40	179.9	13.3	4 9 20	179.8	13.3	5 22 40	243.3	8.3
2 20 0	169.4	13.8	4 10 40	189.9	12.7	6 0 0	236.6	9.1
2 21 20	158.5	14.3	4 12 0	199.5	12.1	6 1 20	229.3	9.8
2 22 40	+147.2	-14.8	4 13 20	-208.6	-11.5	6 2 40	-221.4	+10.5
3 0 0	135.6	15.2	4 14 40	217.3	10.8	6 4 0	213.0	11.1
3 1 20	123.7	15.6	4 16 0	225.5	10.1	6 5 20	204.1	11.8
3 2 40	111.5	16.0	4 17 20	233.1	9.4	6 6 40	194.7	12.4
3 4 0	99.0	16.3	4 18 40	240.1	8.7	6 8 0	184.9	13.0
3 5 20	+ 86.3	-16.6	4 20 0	-246.5	- 8.0	6 9 20	-174.7	+13.5
3 6 40	73.3	16.8	4 21 20	252.3	7.3	6 10 40	164.1	14.0
3 8 0	60.2	17.0	4 22 40	257.6	6.4	6 12 0	153.0	14.5
3 9 20	47.0	17.2	5 0 0	262.3	5.6	6 13 20	141.5	15.0
3 10 40	33.6	17.3	5 1 20	266.4	4.8	6 14 40	129.7	15.4
3 12 0	+ 20.2	-17.4	5 2 40	-269.8	- 4.0	6 16 0	-117.6	+15.8
3 13 20	+ 6.7	17.4	5 4 0	272.6	3.2	6 17 20	105.2	16.1
3 14 40	- 6.8	17.4	5 5 20	274.7	2.3	6 18 40	92.6	16.4
3 16 0	20.3	17.4	5 6 40	276.2	1.5	6 20 0	79.8	16.7
3 17 20	33.7	17.3	5 8 0	277.0	- 0.6	6 21 20	66.8	16.9
3 18 40	- 47.1	-17.2	5 9 20	-277.2	+ 0.2	6 22 40	- 53.6	+17.1
3 20 0	60.3	17.0	5 10 40	276.7	1.1	7 0 0	40.3	17.2
3 21 20	73.4	16.8	5 12 0	275.5	1.9	7 1 20	26.9	17.3
3 22 40	86.3	16.6	5 13 20	273.7	2.7	7 2 40	- 13.4	17.4
4 0 0	99.0	16.3	5 14 40	271.2	3.6	7 4 0	+ 0.1	17.4
4 1 20	-111.5	-16.0	5 16 0	-268.1	+ 4.4	7 5 20	+ 13.6	+17.4
4 2 40	123.7	15.6	5 17 20	264.4	5.2	7 6 40	27.0	17.3
4 4 0	135.7	15.2	5 18 40	-260.1	+ 6.0	7 8 0	+ 40.4	+17.2
4 5 20	-147.2	-14.8						

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.			d. h. m.			d. h. m.		
0 0	+ 0.0	+34.8	2 0	+332.3	+25.5	4 0	+486.3	+ 2.5
0 3	22.8	34.8	2 3	348.6	24.3	4 3	487.3	+ 0.8
0 6	45.6	34.7	2 6	364.1	23.1	4 6	487.3	- 0.8
0 9	68.3	34.5	2 9	378.9	21.9	4 9	486.3	2.4
0 12	90.9	34.2	2 12	392.9	20.6	4 12	484.3	4.1
0 15	+113.2	+33.9	2 15	+406.0	+19.3	4 15	+480.9	- 5.7
0 18	135.3	33.5	2 18	418.3	17.9	4 18	476.6	7.3
0 21	157.1	33.0	2 21	429.5	16.5	4 21	471.3	8.9
1 0	178.5	32.4	3 0	439.8	15.0	5 0	465.0	10.4
1 3	199.6	31.8	3 3	449.1	13.5	5 3	457.7	12.0
1 6	+220.3	+31.1	3 6	+457.5	+12.0	5 6	+449.3	-13.5
1 9	240.4	30.3	3 9	464.9	10.5	5 9	439.9	15.0
1 12	260.0	29.5	3 12	471.3	8.9	5 12	429.6	16.4
1 15	279.0	28.6	3 15	476.6	7.3	5 15	418.4	17.9
1 18	297.4	27.6	3 18	480.8	5.7	5 18	406.3	19.3
1 21	+315.2	+26.6	3 21	+484.0	+ 4.1	5 21	+393.1	-20.6

JUPITER'S SATELLITES, 1861. 469

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h.			d. h.			d. h.		
6 0	+379.2	-21.9	9 18	-240.1	-30.3	13 12	-457.6	+12.0
6 3	364.4	23.1	9 21	259.7	29.5	13 15	449.3	13.5
6 6	348.8	24.3	10 0	278.7	28.6	13 18	440.0	15.0
6 9	332.5	25.5	10 3	297.2	27.6	13 21	429.7	16.4
6 12	315.4	26.6	10 6	315.0	26.6	14 0	418.5	17.8
6 15	+297.6	-27.6	10 9	-332.1	-25.5	14 3	-406.3	+19.2
6 18	279.2	28.5	10 12	348.4	24.4	14 6	393.2	20.6
6 21	260.2	29.4	10 15	363.9	23.2	14 9	379.3	21.9
7 0	240.6	30.3	10 18	378.7	21.9	14 12	364.6	23.1
7 3	220.5	31.1	10 21	392.7	20.6	14 15	349.1	24.3
7 6	+199.9	-31.8	11 0	-405.8	-19.3	14 18	-332.8	+25.4
7 9	178.8	32.4	11 3	418.0	17.9	14 21	315.7	26.5
7 12	157.4	33.0	11 6	429.3	16.5	15 0	298.0	27.5
7 15	135.6	33.5	11 9	439.6	15.0	15 3	279.6	28.5
7 18	113.5	33.9	11 12	449.0	13.5	15 6	260.5	29.4
7 21	+ 91.2	-34.2	11 15	-457.4	-12.0	15 9	-240.9	+30.3
8 0	68.7	34.5	11 18	464.8	10.5	15 12	220.8	31.1
8 3	46.0	34.7	11 21	471.3	8.9	15 15	200.2	31.8
8 6	23.2	34.8	12 0	476.5	7.3	15 18	179.2	32.4
8 9	+ 0.3	34.8	12 3	480.8	5.7	15 21	157.7	33.0
8 12	- 22.5	-34.8	12 6	-484.0	- 4.1	16 0	-135.9	+33.5
8 15	45.3	34.7	12 9	486.2	2.5	16 3	113.8	33.9
8 18	68.0	34.5	12 12	487.3	- 0.8	16 6	91.5	34.2
8 21	90.5	34.2	12 15	487.3	+ 0.8	16 9	69.0	34.5
9 0	112.9	33.9	12 18	486.3	2.4	16 12	46.3	34.7
9 3	-135.0	-33.5	12 21	-484.2	+ 4.0	16 15	- 23.5	+34.8
9 6	156.8	33.0	13 0	480.9	5.7	16 18	- 0.6	34.8
9 9	178.2	32.4	13 3	476.6	7.3	16 21	+ 22.2	34.8
9 12	199.3	31.8	13 6	471.3	8.9	17 0	+ 45.0	+34.7
9 15	-220.0	-31.1	13 9	-465.0	+10.5			

THE APPARENT ELEMENTS OF SATURN'S RING.

Sidereal Date Oh.	α Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u u' Earth's Longitude from Saturn counted on Plane of Ring from the Ring's As- cending Node on	
						Equator.	Ecliptic.
0	42.90	4.08	—5° 46.9	—5° 26.9	—7° 46.6	216° 47.3	173° 31.2
20	44.14	4.53	5 50.2	5 53.4	7 28.2	216 8.1	172 52.1
40	44.93	5.12	5 55.9	6 32.9	7 9.8	214 59.9	171 44.0
60	45.09	5.74	6 2.6	7 21.2	6 51.3	213 35.8	170 20.0
80	44.59	6.21	6 8.8	8 0.5	6 32.7	212 16.4	169 0.9
100	43.56	6.43	6 13.3	8 29.6	6 14.1	211 17.0	168 1.4
120	42.19	6.34	6 14.8	8 38.9	5 55.5	211 0.0	167 44.5
140	40.71	6.04	6 13.7	8 31.7	5 37.0	211 10.6	167 55.2
160	39.31	5.54	6 10.9	8 6.2	5 18.4	211 46.3	168 31.0
180	38.10	4.91	6 4.8	7 23.8	4 59.8	213 3.5	169 48.3
200	37.16	4.20	5 56.7	6 29.0	4 41.2	214 46.5	171 31.4
220	36.52	3.44	5 46.9	5 24.4	4 22.5	216 44.9	173 29.9
240	36.21	2.70	5 36.0	4 16.3	4 3.9	218 54.7	175 39.8
260	36.24	2.47	5 24.4	3 6.6	3 45.3	221 7.8	177 53.6
280	36.62	1.28	5 12.9	2 0.0	3 26.7	223 16.6	180 1.9
300	37.31	0.66	5 2.2	1 1.0	3 8.1	225 14.2	181 59.6
320	38.32	0.15	4 53.1	0 13.3	2 49.5	226 50.8	183 36.3
325	38.62	0.04	4 51.1	—0 4.0	2 44.8	227 11.2	183 56.7
330	38.93	0.05	4 49.4	+0 4.5	2 40.1	227 29.5	184 15.0
335	39.25	0.14	4 47.9	0 1.9	2 35.5	227 44.7	184 30.3
340	39.59	0.21	4 46.5	0 18.0	2 30.8	228 0.3	184 45.9
360	41.01	0.25	4 44.4	0 26.8	2 12.2	228 22.3	185 8.0
366	41.45	0.36	—4 43.0	+0 30.2	—2 7.2	228 37.3	185 23.0

Factor which is to be multiplied by a and b to obtain the axes of

The inner ellipse of the outer Ring	= 0.8801	log. Factor = 9.9445
The outer ellipse of the inner Ring	= 0.8599	" = 9.9344
The inner ellipse of the inner Ring	= 0.6650	" = 9.8228
The inner ellipse of Bond's dusky Ring	= 0.5486	" = 9.7392

NOTE. — The sign of l indicates whether the visible surface of the Ring is northern or southern.

THE APPARENT DISCS OF VENUS AND MARS.

The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.

1861.	Venus.	Mars.	1861.	Venus.	Mars.
January 15	0.880	0.886	July 15	0.952	0.995
February 15	0.932	0.908	August 15	0.896	1.000
March 15	0.969	0.930	September 15	0.824	0.989
April 15	0.993	0.952	October 15	0.741	0.983
May 15	1.000	0.970	November 15	0.637	0.980
June 15	0.986	0.988	December 15	0.507	0.963

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h m		d	h m		
July	8	21 28	♂ ☿ ☾ ☿ - 0 57	Oct.	2	2 31	♂ ♃ ☾ ♃ + 7 2
	10	4 17	♂ ☿ ♀ ☿ - 4 48		2	15 34	♂ ☿ in Aphelion.
	10	13 51	♂ ♃ ☾ ♃ + 5 0		2	20 52	♂ ☿ ☾ ☿ + 6 29
	11	7 17	♂ ♃ ☾ ♃ + 6 33		5	2 17	♂ ☿ ☾ ☿ + 3 12
	11	10 22	♂ ☿ ♂ ☿ - 4 50		6	7 29	♂ ☿ ☾ ☿ + 2 31
	20	16 54	♀ greatest Hel. Lat. N.		15	22 21	♂ ♃ ☾ ♃ - 6 59
	22	0 52	♂ ☿ greatest Hel. Lat. N.		19	0 37	♂ ☿ in Aphelion.
	22	3 27	♂ ☿ ☾ Inf.		20	9 1	♂ ☿ greatest elong. E. 24 12
	26	4 53	♂ ♃ ☾ ♃ - 7 9		22	8 20	♂ ☿ ☾ ☿ - 1 46
	27	2 11	♂ ☿ greatest Hel. Lat. S.		23	1 25	♂ ☿ greatest Hel. Lat. S.
Aug.	31	14 52	♂ ☿ ♃ ☿ + 0 37	Nov.	24	23 24	♂ ♃ ♃ ♃ - 0 52
	1	6 7	♂ ☿ stationary.		29	18 21	♂ ♃ ☾ ♃ + 7 22
	1	8 29	♂ ☿ ☾ ☿ - 2 28		29	19 0	♂ ♃ ☾ ♃ + 6 31
	4	10 59	♂ ☿ ☾ ☿ - 1 44		31	13 12	♂ ☿ ☾ ☿ + 6 18
	6	10 45	♂ ☿ ☾ ☿ + 4 42		31	23 8	♂ ☿ stationary.
	7	7 10	♂ ♃ ☾ ♃ + 5 21		3	3 24	♂ ☿ ☾ ☿ + 0 52
	7	12 58	♂ ☿ ♃ ☿ - 0 20		5	1 17	♂ ☿ ☾ ☿ - 1 44
	7	19 29	♂ ♃ ☾ ♃ + 6 39		10	14 47	♀ greatest Hel. Lat. S.
	7	20 3	♂ ☿ ☾ ☿ + 6 20		11	-	Transit of ♄, invis. at Wash.
	10	8 15	♀ greatest elong. W. 18 49		11	1 24	♀ in ☿
Sept.	15	2 8	♂ in ☿	Dec.	11	14 18	♂ ☿ ☾ Inf.
	19	15 57	♂ in Perihelion.		12	3 15	♂ ♃ ☾ ♃ - 6 55
	22	11 49	♂ ♃ ☾ ♃ - 7 2		15	15 12	♂ in Perihelion.
	25	14 15	♂ ☿ in Aphelion.		18	12 27	♂ ☿ ☾ ☿ - 1 43
	26	14 1	♂ ☿ ☾		20	15 55	♂ ☿ stationary.
	28	18 35	♂ ☿ ☾ ☿ - 2 14		22	23 -	Disapp. of Saturn's Ring.
	29	23 55	♂ ☿ greatest Hel. Lat. N.		25	23 11	♂ ☿ greatest Hel. Lat. N.
	30	10 37	♂ ♃ ☾		26	7 18	♂ ♃ ☾ ♃ + 7 43
	1	19 1	♂ ☿ ♃ ☿ + 0 42		26	11 30	♂ ♃ ☾ ♃ + 6 53
	1	22 15	♂ ☿ ♃ ☿ + 0 53		28	17 22	♂ ☿ greatest elong. W. 20 10
	2	6 52	♂ in ☿		29	4 48	♂ ☿ ☾ ☿ + 5 25
	2	8 11	♂ ☿ ♃ ☿ + 0 10		30	1 51	♂ ☿ ☾ ☿ + 6 9
	4	2 39	♂ ♃ ☾ ♃ + 5 42		4	22 25	♂ ☿ ☾ ☿ - 5 5
	4	3 59	♂ ☿ ☾ ☿ + 5 55		5	17 41	♂ ☿ ☾
	4	5 28	♂ ☿ ☾ Sup.		9	9 32	♂ ♃ ☾ ♃ - 7 15
	4	9 54	♂ ☿ ☾ ☿ + 6 44		13	14 28	♂ ♃ ☾
	4	10 14	♂ ♃ ☾ ♃ + 6 48		15	16 37	♂ ☿ ☾ ☿ - 1 49
	4	12 35	♂ ☿ ♃ ☿ - 0 4		15	17 52	♀ greatest elong. E. 47 16
	4	19 27	♂ ♃ ☾		16	-	☾ Eclipsed, vis. at Wash.
	6	15 38	♂ ☿ ☾ ☿ + 5 53		17	16 1	♂ ♃ ☾
	8	8 35	♂ ☾ ☾		19	10 40	♂ in ☿
	11	7 48	♂ ☿ ♃ ☿ - 0 43		19	23 40	♂ ☾ ☾
	14	18 17	♂ ☿ in ☿		21	2 27	☾ enters ♄, winter begins.
	18	17 32	♂ ♃ ☾ ♃ - 6 57		23	15 54	♂ ♃ ☾ ♃ + 7 57
	21	3 52	♂ ☿ stationary.		23	22 50	♂ ♃ ☾ ♃ + 7 7
	22	8 40	☾ enters ♄, autumn begins.		27	19 35	♂ ☿ ☾ ☿ + 3 55
	22	11 24	♂ ☿ in ☿		29	14 48	♂ in Aphelion.
	22	13 52	♂ ☾ ☾		30	-	☾ Eclipsed, vis. at Wash.
	25	2 40	♂ ☿ ☾ ☿ - 1 58		30	8 10	♂ ☿ ☾ ☿ - 0 59
	1	23 15	♂ ♃ ☾ ♃ + 6 6		31	9 52	☾ in Perigee.

LATITUDES AND LONGITUDES OF THE PRINCIPAL OBSERVATORIES.

- Åbo.** N. Lat. $60^{\circ} 26' 56''.8 \pm 0''.11$. ARGELANDER, *Obs. Astron.*, I. p. xxi.
Long. E. from Paris, $1^h 19^m 47''.3$. *Astr. Nachr.*, IX. 264.
This Observatory was abandoned, and the instruments transferred,
together with the University of Finland, to Helsingfors, in consequence
of the great fire of 1827, by which the University buildings, library,
&c. were destroyed.
- Albany.** N. Lat. $42^{\circ} 39' 50'' \pm 2''$. } GOULD, *Astr. Journal*,
Long. E. from Washington, $0^h 13^m 12''.6 \pm 0''.2$. } V. 144.
- Altona.** N. Lat. $53^{\circ} 32' 45''.27$. GAUSS, *Bestimmung des Breiten-Unterschiedes
zwischen den Sternwarten von Göttingen und Altona*, p. 71. In the
edition of SCHUMACHER's *Hilfstafeln*, published by WARNSTORFF,
Altona, 1845, the latitude of Altona is given, p. 114, as $+53^{\circ} 32' 45''.7$.
Long. E. from Greenwich, $0^h 39^m 46''.151 \pm 0''.042$. STRUVE, *Expéd.
Chronomet. exécutée en 1844, entre Altona et Greenwich*, p. 206.
- Ann Arbor.** . . . N. Lat. $42^{\circ} 16' 48''$. BRÜNNOW, *Astr. Journal*, V. 112.
Long. W. from Washington, $0^h 26^m 41''.0$. BRÜNNOW, *Astr. Journal*, V.
145.
- Athens.** N. Lat. $37^{\circ} 58' 20'' \pm 1''$. BOURIS, *Astr. Nachr.*, XXXIII. 197.
Long. E. from Paris, $1^h 25^m 34''.23 \pm 1''$. *Ergänzungs-Heft zu den Astr.
Nachr.*, 1849, p. 151. This longitude was obtained from moon-culmi-
nating stars observed on ten nights at Athens and Hamburg. The
result of a series observed at Athens and Copenhagen gave the longi-
tude of Athens $6''.84$ farther East, but this series was rejected. *Ibid.*,
pp. 150, 151, 158. Diminishing the E. longitude of Hamburg in con-
formity with STRUVE's chronometric determination, we have for the
longitude of the meridian-circle $1^h 25^m 33''.73 \pm 1''$.
The centre of the Observatory is $0''.19$ W. from the meridian-circle,
Erg.-Heft z. d. Astr. Nachr., p. 152.
- Berlin.** N. Lat. $52^{\circ} 30' 16''.68 \pm 0''.2$. ENCKE, *Astr. Nachr.*, XXIII. 372.
For the Longitude of the centre of the Observatory, we have
Berlin E. from Altona, $0^h 13^m 48''.78 \pm 0.03$ *Berl. Astr. Jahrb.*, 1839,
Altona E. from Greenwich, $0^h 39^m 46''.15$ [p. 275.
Berlin " " $0^h 53^m 34''.98$

THE PRINCIPAL OBSERVATORIES.

The old Observatory was situated $0^{\circ} 56'.72$ North (*Berl. Astr. Jahrb.*, 1839, p. 242; *Astr. Nachr.*, XXIII. 370), and $0^{\circ}.39$ West (*Ibid.*, pp. 261, 265), of the new one. Hence we have for the old Berlin Observatory,

N. Lat. $52^{\circ} 31' 13''.4$.

Long. E. from Greenwich, $0^{\circ} 53^m 84'.54$.

Bilk. N. Lat. $51^{\circ} 12' 25''$. *Astr. Nachr.*, XXVII. 300.
Long. W. from Berlin, $0^{\circ} 26^m 30'$. *Ibid.*

Bonn. N. Lat. $50^{\circ} 43' 45''.0$. } Orally communicated by Prof. ARGE-
Long. E. from Paris, $0^{\circ} 19^m 3'$. } LANDER to the compiler.

The provisional Observatory on the *Alter Zoll*, in which were made the observations published in Vol. I. of the Bonn series, was situated in

N. Lat. $50^{\circ} 44' 9''$.

Long. E. from Paris, $0^{\circ} 19^m 5'.5$. *Bonn Astr. Beob.*, I. p. i.

Breslau. N. Lat. $51^{\circ} 6' 56''$. (MS. communication from Professor BOGUSLAWSKI to Professor ENCKE.) *Berl. Astr. Jahrb.*, 1852, p. 289. The value given in the *Berl. Jahrb.* previously to 1851, was $51^{\circ} 6' 30''.0$.

The Longitude given in the table is derived from a mean of four determinations of the longitude E. from Paris, viz. :—

Triangulation in 1805 (fire-signals), <i>Astr. Nachr.</i> , XVI. 871,	$0^{\circ} 58^m 48'.6$
STECZKOWSKI (6 star-immersions), <i>Ibid.</i> ,	48.17
HANSEN (occultations); <i>Astr. Nachr.</i> , XVII. 170,	48.74
ERMAN and PETERSEN (meteors), <i>Astr. Nachr.</i> , XIX. 27,	48.67
Mean, Breslau E. from Paris,	$0^{\circ} 58^m 48'.54$

Brussels. N. Lat. $50^{\circ} 51' 10''.7$. *Annales de l'Obs. de Bruxelles*, 1837, p. 264.
Long. E. from Greenwich, $0^{\circ} 17^m 27'.6$. QUETELET, *Mém. de l'Acad. R. de Bruxelles*, XVI. 18.

Cambridge (Eng.). N. Lat. $52^{\circ} 12' 51''.76$. *Camb. Phil. Trans.*, V. 279.
Long. E. from Greenwich, $0^{\circ} 0^m 23'.54$. *Ibid.*, III. 168.

Cambridge (Mass.). N. Lat. $42^{\circ} 22' 48''.6$. PEIRCE, *Mem. Amer. Acad.*, N. S., II. 203.
Long. by the telegraphic determinations of the U. S. Coast-Survey, Cambridge E. from Stuyvesant Garden, N. Y.,

By 34 sets of clock-signals,	$0^{\circ} 11^m 26'.10$
" 10 " " star-signals (Western),	26.13
" 24 " " " (exchanged E. and W.),	25.96
" 17 " " " (Eastern),	26.18
Mean,	$0^{\circ} 11^m 26'.09$
Geodetic reduction to dome of Cambridge Observatory,	—0.02
Stuyvesant Garden E. of Jersey City (geodetic),	$0^{\circ} 11^m 38'.00$
Cambridge E. from C. S. Station, Jersey City,	$0^{\circ} 12^m 3'.54$
Jersey City E. from Washington (see Philadelphia),	$0^{\circ} 23^m 41'.54$
Cambridge (dome) E. from Washington,	

Cape of Good Hope. S. Lat. $33^{\circ} 56' 8''$. HENDERSON, *Mem. R. Astr. Soc.*, VI. 130.

Long. E. from Greenwich,

By Greenwich Observations, $1^{\text{h}} 13^{\text{m}} 56.1$ *Ibid.*, p. 126.

" Cambridge " 55.04 " p. 127.

" Åbo " 58.56 " p. 128.

" Edinburgh " 54.2 " p. 129.

Mean, $1^{\text{h}} 13^{\text{m}} 56.0$

Christiania. . . N. Lat. $59^{\circ} 54' 43''.7$.

Long. E. from Paris, $0^{\text{h}} 33^{\text{m}} 33.3$. } *Astr. Journal*, II. 173.

Cincinnati. . . N. Lat. $39^{\circ} 5' 54''$. *Astr. Nachr.*, XXIII. 313.

Long. W. from Washington, $0^{\text{h}} 29^{\text{m}} 46.85$. (U. S. Coast-Survey.) *Proc. Amer. Assoc. for Adv. Science*, Cincinnati, 1851, p. 118.

Copenhagen. . . By Copenhagen Observatory is usually understood the "Round Tower" of the University. The new instruments are, however, mounted in a temporary wooden building known as "Holkens Bastion." (See *Astr. Nachr.*, XIX. 119).

N. Lat. of the Round Tower, $55^{\circ} 40' 53''$. *Astr. Nachr.*, V. 366.

For the Longitude,

Holkens Bastion E. from Altona,

HANSEN (*Astr. Nachr.*, VIII. 281), $0^{\text{h}} 10^{\text{m}} 32.585$ (189.88)

SCHUMACHER (*Astr. Nachr.*, IX. 463), 82.565 (19.42)

Mean, $10^{\text{m}} 32.583$

Altona E. from Greenwich, $39^{\circ} 46.151$

Holkens Bastion E. from Greenwich, $50^{\circ} 18.734$

Round Tower E. from Holkens Bastion (WURM,

Astr. Nachr., III. 438; V. 337), 0.57

Round Tower E. from Greenwich, $0^{\text{h}} 50^{\text{m}} 19.80$

Cracow. . . . N. Lat. $50^{\circ} 3' 50''.0 \pm 0.09$. WEISSE, *Astr. Nachr.*, VIII. 175; XVI. 256.

Longitude E. from Paris,

Mean of 19 obs. by WURM (*Astr. Nachr.*, VII.

458, VIII. 358), (6 of the 25 being rejected,) $1^{\text{h}} 10^{\text{m}} 28.986 \pm 0.461$

Mean of 25 obs. by STECZKOWSKI (*Astr. Nachr.*,

XVI. 352), 30.221 ± 0.301

Mean of 4 obs. by STECZKOWSKI (*Astr. Nachr.*,

XVIII. 332), 29.760 ± 0.085

Mean of 16 obs. of three occultations (STECZ-

KOWSKI, *Astr. Nachr.*, X. 232), 30.95 ± 0.253

Assigning to each of these determinations a weight proportional to the number of observations from which it was derived, we obtain the mean,

Cracow E. from Paris, $1^{\text{h}} 10^{\text{m}} 29.78$

Göttingen West of Altona, $0^h 0^m 0.049$

Altona East of Greenwich, $0^h 39^m 46.151$

Göttingen East of Greenwich, $0^h 39^m 46.102$

For the old Observatory,

Lat. = $+51^\circ 31' 55''.6$. *Monatl. Corr.*, XXVII. 483.

Long. E. of Paris, $0^h 30^m 25''.2$. *Astr. Nachr.*, II. 497, 408.

Greenwich. . . . N. Lat. $51^\circ 28' 38''.2$. *AIRY, Mem. Astr. Soc.*, XVII. 49.
Long. W. from Paris, $0^h 9^m 21''.46 \pm 15$. *HENDERSON, Phil. Trans.*,
1827, p. 286. See also Washington.

Hamburg. . . . N. Lat. $53^\circ 38' 7''$, by geodetical connection with Altona. *Preface to*
RÜMKE's Catalogue.

The Longitude given in the table is derived thus:—

Hamburg E. from Altona (*HANSEN, Astr. Nachr.*,
VIII. 277), $0^h 0^m 7.41$

Altona E. from Greenwich (*STRUVE, Exp. Chron.*
de 1844), $0^h 39^m 46.15$

Whence Hamburg E. from Greenwich, $0^h 39^m 53.56$

Hudson. . . . N. Lat. $41^\circ 14' 42''.6$. *LOOMIS, Trans. Am. Phil. Soc.*, N. S., X. 61.
Long. W. from Philadelphia (U. S. Coast-Survey),

By 8 sets Eastern clock-signals, $0^h 25^m 5.72$

" 2 " Western " 5.68

$0^h 25^m 5.70$

Philadelphia E. from Washington, $7^h 33.64$

Hudson W. from Washington, $0^h 17^m 32.06$

Professor LOOMIS deduced from moon-culminations,

Hudson W. from Greenwich, $5^h 25^m 41''.3$. *Astr. Journ.*, I. 67.

Kasan. . . . N. Lat. $55^\circ 47' 23''.1$. *Astr. Nachr.*, XXVIII. 47.
Long. E. from Berlin, $2^h 22^m 57''.0$. *Berl. Astr. Jahrb.*, 1854, p. 293.

Königsberg. . . . N. Lat. $54^\circ 42' 50''.4$. *BESSEL, Astr. Nachr.*, I. 248.
Long. E. from Paris, $1^h 12^m 38.8$ *WURM, Astr. Nachr.*, III. 437.
 38.93 *BESSEL*, " III. 46.
Mean, $1^h 12^m 38.9$

Kreuznach. . . . N. Lat. $48^\circ 3' 23''.81 \pm 0''.03$. *Astr. Nachr.*, XXXVII. 271.
Long. E. from Paris, $0^h 47^m 11''.96$. *SCHUMACHER, Astr. Nachr.*,
XXIII. 263.

Leipzig. . . . (Pleissenburg.)
N. Lat. *D'ARREST, Astr. Nachr.*, XXVIII.
148, $51^\circ 20' 20.7 \pm 0.36$ *Weight.* 26.37
D'ARREST, Astr. Nachr., XXVIII. 160, 20.4
Long. E. from Greenwich, $0^h 49^m 28''.5$

THE PRINCIPAL OBSERVATORIES.

Leyden.	N. Lat. $52^{\circ} 9' 28''.16 \pm 0''.15$ Long. E. from Paris, $0^{\text{h}} 8^{\text{m}} 35''.97 \pm 0''.19$	} KAISER, <i>Astr. Nachr.</i> , XVII 100.
Liverpool.	N. Lat. $53^{\circ} 24' 47''.40$. <i>Memoirs R. Astr. Soc.</i> , XXVI 7. Long. W. from Greenwich, $0^{\text{h}} 12^{\text{m}} 0''.11$. <i>Naut. Alm.</i> , 1852, p. 598.	
London.	(Mr. Bishop's Observatory.) N. Lat. $51^{\circ} 31' 29''.8$. <i>Astr. Obs. at the Observatory South Villa</i> , p. xix. Long. W. from Greenwich, $0^{\text{h}} 0^{\text{m}} 37''.1$.	
Madras.	N. Lat. $13^{\circ} 4' 9''.2$. Long. E. from Greenwich, $5^{\text{h}} 20^{\text{m}} 57''$. TAYLOR, <i>Madras General Catal.</i> , 1844, <i>Pref.</i> p. ii.	
Mannheim.	N. Lat. $49^{\circ} 29' 12''.9$. <i>Astr. Nachr.</i> , XII 129. Long. E. from Paris, as determined	
	By WURM, from occultations (<i>Astr. Nachr.</i> , VIII 458),	$0^{\text{h}} 24^{\text{m}} 29.92$
	" connection with Strasburg (<i>Astr. Nachr.</i> , XV 280),	29.87
	" " " Vienna (<i>Astr. Nachr.</i> , XV 279 ; XXIII 263),	30.28
	By connection with Dunkirk (MÜFFLING, <i>Astr. Nachr.</i> , XV 279),	30.05
	By OLUFSEN from solar eclipse (<i>Astr. Nachr.</i> , XXII 234),	30.10
	Mean,	$0^{\text{h}} 24^{\text{m}} 30.04$
Markree.	N. Lat. $54^{\circ} 10' 31''.72$. <i>Astr. Journal</i> , II 12. Long. W. from Greenwich, $0^{\text{h}} 33^{\text{m}} 48''.4$. <i>Naut. Alm.</i> , 1852, p. 598.	
Marseilles.	N. Lat. $43^{\circ} 17' 49''$. <i>Monatl. Corresp.</i> , XIII 139. Long. E. from Paris, according to	
	LINDENAU (<i>Monatl. Corr.</i> , XIX 421),	$0^{\text{h}} 12^{\text{m}} 7.7$
	WURM (<i>Monatl. Corr.</i> , XXVI 185),	7.6
	" (<i>Astr. Nachr.</i> , IV 38),	7.5
	INNES (<i>Astr. Nachr.</i> , VIII 435),	7.05
	Mean,	$0^{\text{h}} 12^{\text{m}} 7.53$
Milan.	(Brera.) N. Lat. $45^{\circ} 28' 0''.7$. <i>Corresp. Astron.</i> , V 300; <i>Effem. Astr. di Mi-</i> <i>lano</i> , 1846, <i>App.</i> , pp. 73-86. Long. E. from Paris,	
	DAUSSY found from 31 occultations (<i>Conn. d. Temps</i> , 1836, <i>Add.</i> , p. 131),	$0^{\text{h}} 27^{\text{m}} 24.91$
	LITTEBOW found Milan W. from Vienna (<i>Ibid.</i>), 23 45.63	56 11.07
		$0^{\text{h}} 27^{\text{m}} 25.44$
	Mean,	$0^{\text{h}} 27^{\text{m}} 25.18$

- Modena.** N. Lat. $44^{\circ} 38' 52''.75$. BIANCHI, *Astr. Nachr.*, XVI. 221; *Atti del R. Osserv. di Modena*, I. 336 (1884).
 Long. E. from Milan, $0^h 6^m 55''.99$. *Ibid.*, p. 337.
 Hence E. from Paris,
 By comparison with Milan $0^h 34^m 20''.45$
 WURM from occultations, 23.5 *Astr. Nachr.*, I. 504.
 " " " 24.5 " III. 222.
 STECZKOWSKI from occultations, 21.81 " XVI. 299, 302.
 OLUFSEN from solar eclipse, 22.32 " XXII. 234.
 Mean, $0^h 34^m 22''.51$
- Moscow.** N. Lat. $55^{\circ} 45' 19''.88 \pm 0.08$. SCHWEIZER, *Astr. Nachr.*, XXXVIII. 100.
 Long. E. from Greenwich, $2^h 30^m 16''.98$. *Astr. Nachr.*, XXXVIII. 103.
- Munich.** (Bogenhausen).
 N. Lat. $48^{\circ} 8' 45''$. SOLDNER, *Astr. Nachr.*, IX. 422.
 Long. E. from Paris, $0^h 37^m 4''.98$. *Astr. Nachr.*, VIII. 148.
- Naples.** N. Lat. $40^{\circ} 51' 46''.63$. BRIOSCHI, *Astr. Nachr.*, V. 294.
 The Longitude adopted is that by which PETERS has apparently made his reductions, *Astr. Nachr.*, XXIII. 302, 303, according to which we have,
 Naples E. from Berlin, $0^h 3^m 26''.0$.
 For determinations from solar eclipses by BRIOSCHI and SANTINI, see
Astr. Nachr., VI. 413.
- Olmütz.** N. Lat. $49^{\circ} 35' 40''$.
 Long. E. from Greenwich, $1^h 9^m 0''.1$. } *Astr. Nachr.*, XXXVII. 77.
- Oxford.** N. Lat. $51^{\circ} 45' 36''.0$.
 Long. W. from Greenwich, $0^h 5^m 2''.6$. } *Naut. Alm.*, 1852, p. 599.
- Padua.** N. Lat. $45^{\circ} 24' 2''.5$. SANTINI, *Astr. Nachr.*, VI. 411; XVII. 346.
 Long. E. from Paris,
 WURM (*Astr. Nachr.*, IV. 347), $0^h 38^m 7''.7$
 Padua E. from Milan by powder signals
 (FALLON, *Astr. Nachr.*, IV. 115), $0^h 10^m 48''.27$
 Milan E. from Paris, $27^m 24''.18$
 Mean, Padua E. from Paris, $0^h 38^m 7''.57$
- Palermo.** N. Lat. $38^{\circ} 6' 44''$. CACCIATORE, *Del Real Osservatorio di Palermo Libri*, VII, VIII, IX, p. 2; *Storia Celeste del R. Osserv. di Palermo*, in *Ann. d. Wiener Sternwarte*, XXIV. 6.
 Long. E. from Paris, $0^h 44^m 4''.0$. DAUSSY, *Add. Conn. d. Temps*, 1835, p. 8.
 BIANCHI, *Astr. Nachr.*, XVII. 350, calls the latitude of the Palermo Observatory, $+38^{\circ} 6' 25''.50$.

- Paramatta.** . . . S. Lat. $33^{\circ} 48' 49''.79$. RÜMKEB, *Phil. Trans.*, 1829, Part III. p. 16.
Long. E. from Greenwich, $10^{\text{h}} 4^{\text{m}} 6^{\text{s}}.25$. *Ibid.*, p. 29.
- Paris.** N. Lat. $48^{\circ} 50' 13''.2$. *Conn. d. Temps*, 1835, p. 356.
Long. as above under Greenwich.
- St. Petersburg.** . . (Academy.)
N. Lat. $59^{\circ} 56' 29''.67$.
Long. W. from Pulkowa, $0^{\text{h}} 5^{\text{m}}.194$. STRUVE, *Description de l'Obs. de Poulkova*, p. 292.
- Philadelphia.** . . N. Lat. $39^{\circ} 57' 7''.5$. MS. communication from Professor KENDALL.
Long. E. from Washington (U. S. Coast Survey),
By 5 sets Eastern clock-signals, $7^{\text{m}} 33.66$
" " Western " 33.60
Mean, $7^{\text{m}} 33.63$
Long. Jersey City Station E. from Washington,
By 2 sets Eastern clock-signals, $12^{\text{m}} 3.58$
" " Western " 3.52
Mean, $12^{\text{m}} 3.56$
Long. W. from Jersey City Station,
By 8 sets Eastern clock-signals, $4^{\text{m}} 29.91$
" " " " 29.84
Mean, $4^{\text{m}} 29.88$
Hence we may use,
Jersey City Station E. from Philadelphia, $0^{\text{h}} 4^{\text{m}} 29.89$
" " " Washington, $0^{\text{h}} 12^{\text{m}} 3.53$
Philadelphia " " $0^{\text{h}} 7^{\text{m}} 33.64$
- Prague.** N. Lat. $50^{\circ} 5' 18''.5$. DAVID, *Astr. Nachr.*, VIII. 198.
Long. E. from Paris,
Mean of 6 occultations (*Astr. Nachr.*, XVI. 299,
802), $0^{\text{h}} 48^{\text{m}} 21.66 \pm 4.15$
HANSEN from occultations (*Astr. Nachr.*, XVII.
170), 19.59 ± 3.67
Mean, Prague E. from Paris, $0^{\text{h}} 48^{\text{m}} 20.50$
- Pulkowa.** N. Lat. $59^{\circ} 46' 18''.70$. STRUVE, *Descr. de l'Obs. de Poulkova*, p. 290.
Long. E. from Altona (*Exp. Chron. de* 1843,
p. 144), $1^{\text{h}} 21^{\text{m}} 32.523 \pm 0.039$
Altona E. from Greenwich (*Exp. Chron. de*
1844, p. 206), $0^{\text{h}} 39^{\text{m}} 46.151 \pm 0.042$
Pulkowa E. from Greenwich (*Exp. Chron. de*
1844, p. ix.), $2^{\text{h}} 1^{\text{m}} 18.674 \pm 0.057$
- Rome.** (Collegio Romano.)
N. Lat. $41^{\circ} 53' 54''.$ *Conn. d. Temps*, 1840, p. 354.
Long. E. from Greenwich, $0^{\text{h}} 49^{\text{m}} 54^{\text{s}}.7$. *Astr. Nachr.*, VIII. 88.

- San Fernando.** . . . N. Lat. $36^{\circ} 27' 45''$. *Corresp. Astron.*, XIV. 240.
 Long. W. from Paris, $0^h 34^m 10^s.6 \pm 0^s.31$. *Astr. Nachr.*, IX. 358.
- Santiago.** . . . (National Observatory.)
 S. Lat. $33^{\circ} 26' 24''.8$. GILLISS, *Astron. Journal*, III. 55.
 Long. W. from Greenwich, $4^h 42^m 18^s.9$. GILLISS, *Astron. Journal*, II. 118.
- Senftenberg.** . . . N. Lat. $50^{\circ} 5' 10''.1$.
 Long. E. from Berlin, $0^h 12^m 15^s$. } *Astr. Nachr.*, XXXI. 174, 331.
- Upsala.** N. Lat. $59^{\circ} 51' 31''.5$. SCHULTZ, *Nova Acta Reg. Soc. Sc. Upsala*, II. 206.
 Long. W. from Stockholm, $0^h 1^m 43^s.64$ *Ibid.*, II. 218.
 Stockholm E. from Greenwich, $1\ 12\ 14.8$
 Upsala E. from Greenwich, $1\ 10\ 31.2$
- Vienna.** N. Lat. $48^{\circ} 12' 35''.5$. *Berl. Astr. Jahrb.*, 1852, p. 290.
 Long. E. from Paris, $0^h 56^m 11^s.07$. SCHUMACHER, *Astr. Nachr.*, XXIII. 263.
- Washington.** . . . N. Lat. $38^{\circ} 53' 39''.25$. *Astron. Journ.*, III. 12.
 Long. W. from Greenwich, as derived from data of the U. S. Coast Survey, up to 1852, $5^h 8^m 11^s.2$.
 The situation of the first, or provisional, Naval Observatory, in which were made the observations published by Lieutenant GILLISS, was,
 N. Lat. $38^{\circ} 53' 32''.8$. GILLISS, *Astr. Obs.*, p. viii.
 Long. W. from Greenwich, $5^h 8^m 4^s.6$. *Ibid.*, p. x.
- Wilna.** N. Lat. $54^{\circ} 40' 59''.1$. *Astr. Nachr.*, IV. 562.
 Long. E. from Paris,
 WURM from 22 occultations (*Astr. Nachr.*, VIII. 96), $1^h 31^m 50^s.4$
 STECZKOWSKI from 1 occultation (*Astr. Nachr.*, XVI. 302), 48.3
 Mean, $1\ 31\ 50.81$

These results are arranged in the following Table for reference.

POSITIONS OF THE PRINCIPAL OBSERVATORIES.

(North Latitudes and West Longitudes are considered as positive.)

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Arc.	Longitude from Greenwich in Arc.
Åbo,	+60° 26' 56.8	— 6 37 20.0	260° 40' 0.6	337° 42' 48.6
Albany,	+42 39 50.0	— 0 13 12.6	356 41 51.0	73 44 39.0
Altona,	+53 32 45.3	— 5 47 57.4	273 0 39.8	350 3 27.8
Ann Arbor,	+42 16 48.0	+ 0 26 41.0	6 40 15.0	83 43 3.0
Athens,	+37 58 20.0	— 6 43 6.4	259 13 24.2	336 16 12.2
Berlin,	+52 30 16.7	— 6 1 46.1	269 33 28.1	346 36 16.1
Bilk,	+51 12 25.0	— 5 35 16.1	276 10 58.1	353 13 46.1
Bonn,	+50 43 45.0	— 5 36 35.7	275 51 5.1	352 53 53.1
Breslau,	+51 6 56.0	— 6 16 21.2	265 54 42.0	342 57 30.0
Brussels,	+50 51 10.7	— 5 25 38.8	278 35 18.0	355 38 6.0
Cambridge (Eng.),	+52 12 51.8	— 5 8 34.7	282 51 18.9	359 54 6.9
Cambridge (Mass.),	+42 22 48.6	— 0 23 41.5	354 4 36.9	71 7 24.9
Cape of Good Hope,	—33 56 3.0	— 6 22 7.2	264 28 12.3	341 31 0.3
Christiania,	+59 54 43.7	— 5 51 6.0	272 13 30.6	349 16 18.6
Cincinnati,	+39 5 54.0	+ 0 29 46.9	7 26 42.8	84 29 30.8
Copenhagen,	+55 40 53.0	— 5 58 30.5	270 22 22.5	347 25 10.5
Cracow,	+50 3 50.0	— 6 28 2.4	262 59 23.4	340 2 11.4
Dorpat,	+58 22 47.1	— 6 55 5.8	256 13 32.6	333 16 21.6
Dublin,	+53 23 13.0	— 4 42 49.2	289 17 42.0	6 20 30.0
Durham,	+54 46 6.4	— 5 1 53.2	284 31 42.0	1 34 30.0
Edinburgh,	+55 57 23.2	— 4 55 28.2	286 7 57.0	3 10 45.0
Florence,	+43 46 40.8	— 5 53 12.9	271 41 47.1	348 44 35.1
Geneva,	+46 11 58.8	— 5 32 48.9	276 47 46.8	353 50 34.8
Georgetown,	+38 54 26.1	+ 0 0 6.2	0 1 33.0	77 4 21.0
Göttingen,	+51 31 47.9	— 5 47 57.3	273 0 40.5	350 3 28.5
Gotha,	+50 56 5.2	— 5 51 6.9	272 13 17.1	349 16 5.1
Greenwich,	+51 28 38.2	— 5 8 11.2	282 57 12.0	0 0 0.0
Hamburg,	+53 33 7.0	— 5 48 4.8	272 58 48.6	350 1 36.6
Hudson,	+41 14 42.6	+ 0 17 32.1	4 23 0.9	81 25 48.9
Kasan,	+55 47 23.1	— 8 24 43.1	233 49 13.1	310 52 1.1
Königsberg,	+54 42 50.4	— 6 30 11.6	262 27 6.6	339 29 54.6
Kremsmünster,	+48 3 23.8	— 6 4 44.6	268 48 50.7	345 51 38.7
Leipsic,	+51 20 20.7	— 5 57 39.7	270 35 4.5	347 37 52.5
Leyden,	+52 9 28.2	— 5 26 8.6	278 27 50.6	355 30 38.6
Liverpool,	+53 24 47.4	— 4 56 11.1	285 57 13.7	3 0 1.7
London,	+51 31 29.8	— 5 7 34.1	283 6 28.5	0 9 16.5
Madras,	+13 4 9.2	—10 29 8.2	202 42 57.0	279 45 45.0
Mannheim,	+49 29 12.9	— 5 42 2.7	274 29 19.5	351 32 7.5
Markree,	+54 10 31.7	— 4 34 22.8	291 24 18.0	8 27 6.0
Marseilles,	+43 17 49.0	— 5 29 40.2	277 34 57.2	354 37 45.2
Milan,	+45 28 0.7	— 5 44 57.8	273 45 32.4	350 48 20.4
Modena,	+44 38 52.8	— 5 51 55.2	272 1 12.5	349 4 0.5
Moscow,	+55 45 19.8	— 7 38 28.1	245 22 58.5	322 25 46.5
Munich,	+48 8 45.0	— 5 54 37.6	271 20 35.4	348 23 23.4
Naples,	+40 51 46.6	— 6 5 12.1	268 41 58.1	345 44 46.1
Olmütz,	+49 35 40.0	— 6 17 11.3	265 42 10.5	342 44 58.5
Oxford,	+51 45 36.0	— 5 3 8.6	284 12 51.0	1 15 39.0
Padua,	+45 24 2.5	— 5 55 40.2	271 4 56.6	348 7 44.6
Palermo,	+38 6 44.0	— 6 1 36.7	269 35 50.1	346 38 38.1
Paramatta,	—33 48 49.8	+ 8 47 42.6	131 55 38.3	208 58 26.3
Paris,	+48 50 13.2	— 5 17 32.7	280 36 50.1	357 39 38.1

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Arc.	Longitude from Greenwich in Arc.
St. Petersburg, . .	+59° 56' 29.7	^h ^m ^s —7 9 24.7	252° 38' 49.8	329° 41' 37.8
Philadelphia, . . .	+39 57 7.5	—0 7 33.6	358 6 35.4	75 9 23.4
Prague,	+50 5 18.5	—6 5 53.2	268 31 42.6	345 34 30.6
Pulkowa,	+59 46 18.7	—7 9 29.9	252 37 31.9	329 40 19.9
Rome,	+41 58 54.0	—5 58 5.9	270 28 31.5	347 31 19.5
San Fernando, . . .	+36 27 45.0	—4 43 22.1	289 9 29.1	6 12 17.1
Santiago,	—33 26 24.8	—0 25 52.3	353 31 55.5	70 34 43.5
Senftenberg, . . .	+50 5 10.1	—6 14 1.1	266 29 43.1	343 32 31.1
Upsala,	+59 51 31.5	—6 18 42.4	265 19 24.0	342 22 12.0
Vienna,	+48 12 35.5	—6 13 43.7	266 34 4.1	343 36 52.1
Washington,	+38 53 39.3	—0 0 0.0	0 0 0.0	77 2 48.0
Wilna,	+54 40 59.1	—6 49 23.0	257 39 15.5	334 42 3.5

ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

THIS Ephemeris is divided into two distinct parts. One part is designed for the special use of NAVIGATORS, and is adapted to the Meridian of Greenwich.

The other part is suited to the convenience of ASTRONOMERS, on this continent particularly, and is adapted to the Meridian of Washington.

THE NAUTICAL PART.

This part contains the Ephemeris of the Sun and Moon; the Distances of the Moon from the centres of the Sun and the four most conspicuous Planets, and from certain Fixed Stars; the Ephemeris of the Planets Venus, Mars, Jupiter, and Saturn; the Mean Places of 100 principal Fixed Stars, for January 1, 1861.

Time.—Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

Sidereal Time.—Sidereal Time is measured by the daily motion of the stars, or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

Solar Time.—Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity.

Mean Time, which is perfectly equable in its increase, is measured by the motion of this *Mean Sun*; the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it.

True or Apparent Time is measured by the motion of the real sun.

The difference between the *true* and *mean* time is called the *Equation of Time*. By means of it we pass from *true* to *mean* time, or the reverse. Thus, if the *true* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *true* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

The vernal equinox, by the motion of which Sidereal Time is measured, is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical. In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the Sidereal Time in common use might therefore be called *Apparent Sidereal Time*, and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed $2^{\text{h}}.3$ in a period of nineteen years, and is, therefore, of no practical importance.

Day. — According to the customs of society, the hours are counted from 0 to 12 from noon to midnight, after which they are again reckoned from 0 to 12 from midnight to noon. The *civil day* consists of twenty-four hours, but is divided in this manner into two periods, commencing at midnight. In this respect it differs from the *astronomical day*, which commences at noon. The *civil day* comprises twenty-four hours, from one midnight to the next following. The first period of twelve hours is marked A. M., the last period of twelve hours is marked P. M. The *astronomical day* also comprises twenty-four hours, but they are counted from 0 to 24, and from the noon of one day to that of the next following.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day*. Thus, January 10th, 2^{h} A. M., *civil day*, is January 9th, 14^{h} , *astronomical day*; and January 9th, 2^{h} P. M., *civil day*, is also January 9th, 2^{h} , *astronomical day*. The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows: —

Pages I., II., III. are devoted to the Ephemeris of the Sun. Page I. contains, first, the *Apparent Right Ascension and Declination* of the sun at Greenwich apparent noon.

The former of these quantities is used for finding the error of a clock regulated to sidereal time. The difference between the time by the clock of the meridian passage of the sun, and the sun's right ascension reduced to apparent noon, is the error of the clock from sidereal time. It is also employed in determining the time by the transit of a fixed star over the meridian, as is explained in page 223 of BOWDITCH'S *American Practical Navigator*. The use of the sun's declination in finding the true amplitude and azimuth, the latitude by altitudes of the sun in and out of the meridian, the time, &c., is also so clearly defined in this standard work, which is in the hands of all American seamen, that any further explanation in this place is unnecessary. Adjoining the columns of *Right Ascension* and *Declination* are the differences of these quantities for one hour (at noon), by means of which they may be calculated for any time out of the meridian, by multiplying this difference by the hours and parts of hours from noon, and adding the amount to, or subtracting it from, the quantity at noon, according as it is increasing or decreasing. If, for example, the declination of the sun were required at $3^{\text{h}} 40^{\text{m}}$ P. M. of Friday, January 18th, 1861, the declination of the sun would be taken out first for

January 18th, at noon,	$20^{\circ} 29' 12.8''$ S.
From which subtract the diff. for 1 hour, $30''.91$, multiplied by 3,	$1\ 32.7$
	$20\ 27\ 28.5$
And the proportional part for 40 minutes,	20.6
The result is the sun's declination on the 18th, at $3^{\text{h}} 40^{\text{m}}$ P. M.,	$20\ 27\ 7.9$

The difference for one hour is not the same for every hour in the twenty-four; but being given in the pages of this Ephemeris for the first hour of the day, it is sufficiently accurate for the purposes of the navigator.

The column of the *Sun's Semidiameter* requires no explanation.

The column headed *Sidereal Time of the Semidiameter passing the Meridian*, is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. If the western limb has been observed, the quantity found in this column is to be added to the time of transit over the middle wire, or the mean of the times of transit over all the wires; but if the eastern limb has been observed, the quantities in this column are to be subtracted.

The next column contains the *Equation of Time*, which, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent time*, or the time given by an observation of the sun, to obtain the *mean time*, or the time shown by a clock. The heading of the column directs the manner in which the equation is to be applied, and where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. The difference for one hour is given in an adjoining column, by means of which the equation for any time from noon is easily obtained. If, for example, the equation of time for January 16th, at 3^h 20^m P. M., were required, we should have

Equation for January 16, at noon,	m. 5.84
Correction for 3 ^h 20 ^m (additive),	2.82
Equation, January 16, at 3 ^h 20 ^m P. M.,	10 12.66

Which, according to the rule at the head of the column, is to be added to *apparent time* to obtain *mean time*.

Page II. contains the Apparent Right Ascension and Declination of the Sun, and the Equation of Time for Greenwich *Mean Noon*; to these is added a column containing the *Sidereal Time of Mean Noon*.

Page III. contains the Longitude and Latitude of the Sun, and the Logarithm of the Distance of the Earth, at Greenwich Mean Noon of each day. The Longitude is given in two columns, headed λ and λ' ; the one, λ , is the Sun's longitude counted from the true equinox of the date; the other, λ' , is the same coördinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the Sun's longitude for any hour from noon. The hourly differences of the logarithm of the Radius Vector are likewise given. The longitudes of the Sun are the true longitudes, not affected by aberration. The last column on this page contains the Mean Time of Sidereal Noon.

Page IV. contains the Moon's *Semidiameter* and *Horizontal Parallax* for every noon and midnight. The former may be corrected for any time between the dates for which it is given in the Ephemeris, by means of Table XI. of BOWDITCH'S *Navigator*, or simply by computing the proportional part.

This is readily done by considering that the semidiameter is given for every twelve hours, that the difference, therefore, between any two successive semidiameters corresponds to twelve hours, and that the difference required (or correction) is that difference which corresponds to a time less than twelve hours. If, for example, the semidiameter of the moon is to be taken out for 9 o'clock, P. M. of the 23d of January, then we say, that as twelve hours is to 6".6, the whole difference between the semidiameters at noon and midnight of the 23d, so is nine hours to 5".0, the correction to be added to the semidiameter at noon, because it is increasing; the moon's semidiameter, then, for Jan. 23^d 9^h is 15' 37".1. Adjoining the columns containing the Moon's

Horizontal Parallax for noon and midnight, are columns giving the change which these quantities undergo in one hour. The sign plus or minus (+ or —) is prefixed to these differences, showing whether they are additive or subtractive, or, in other words, whether the horizontal parallax is increasing or decreasing. In order to reduce the parallax to any time intermediate between those dates for which it is given in the Ephemeris, the mode of proceeding is that which has been already explained in the case of the equation of time. The Moon's *Meridian Passage*, which is given on this page to minutes and tenths of minutes, is also accompanied with a column of differences for one hour, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. Or it may be more quickly derived from BOWDITCH'S Table XVIII., by simple inspection. The last column of this page contains the *Age* of the Moon, to tenths of days, or the time elapsed since the preceding new moon. It requires no explanation.

The pages from V. to XII. inclusive are taken up with the Moon's *Right Ascension and Declination*, which are given for every hour of every day in the month, and are accompanied with columns of differences for every minute of each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. These quantities are wanted for Greenwich mean time, which is either taken directly from the face of a well-regulated chronometer, or is obtained by applying the longitude, turned into time, to the local time of the computer. They have only to be corrected for the minutes and seconds of the time at Greenwich. Thus, if the right ascension and declination of the moon were required for Tuesday, January 1^d 8^h 10^m, we have only to add to the right ascension at 8^h as given in the Ephemeris, viz. to 10^h 47^m 3^s.72, the product of the difference for one minute in the adjoining column multiplied by 10, the product, that is, of 2^s.1303 by 10, or 21^s.30; the result is the moon's right ascension at the required time, equal to 10^h 47^m 25^s.02. If we were to take out the declination for the same date, the correction for the ten minutes above the hour would be subtractive, because the declination, unlike the right ascension, is decreasing; thus,

Moon's declination for January 1 ^d 8 ^h	3 25 9.6 N.
Correction for 10 ^m is 153 ^s .7, or	2 33.7
Moon's declination for January 1 ^d 8 ^h 10 ^m	3 22 35.9

The last page of the right ascensions and declinations contains the *Phases* of the Moon, and the dates of the Moon's *Perigee* and *Apogee*, or least and greatest distances from the earth.

The remaining six pages of the month are occupied by the *Lunar Distances*. They are given in the same manner as in the *British Nautical Almanac*, in order to conform to the rules of BOWDITCH'S *Navigator*. These tables contain the geocentric distances of the centre of the moon from the sun, the larger planets, and certain fixed stars, at intervals of three hours, beginning with the noon of each day. All the distances that can be observed on the same day are grouped together under that date, and the letter E. or W. is affixed to the name of the star or planet, to indicate whether it is on the east or west side of the moon. The columns are read from the left to the right, across both pages of the same opening. The principle of determining the longitude by means of lunar distances consists in this: that they furnish the navigator with the means of comparing his own time, on board ship, with the time at the Greenwich Observatory. At the moment of observing a distance he notes the time by his own watch or chronometer, and by looking into the Ephemeris he discovers what o'clock it is at Greenwich when the moon and star are in the relative position with regard to each other which he has measured with his sextant. But it will very rarely occur that the navigator's *true distance*, that is, his observed distance cleared from the effects of refraction and

lunar parallax, will be found in the Ephemeris. It will prove in most cases to be a quantity lying between two given distances. He is obliged, therefore, to take the difference between his own true distance and the one nearest to it in the pages of the Ephemeris, and to apply to the time standing over the latter a correction proportioned to this difference. This is a case of the simple rule of three. Owing, however, to the various denominations of space and time that enter into the question, it has been found convenient to lessen the labor of the operation by putting between every two successive distances given in the Ephemeris the proportional logarithm of their difference. This proportional logarithm is obtained by subtracting the logarithm of the difference of the two distances from the logarithm of three hours (both quantities being reduced to seconds), because three hours is the interval of time between two successive distances.

On the 1st of March, at midnight, of Greenwich mean time, the distance of the moon's centre from the planet Saturn, west of her, is $72^{\circ} 35' 11''$, and at fifteen hours of the same date it is $74^{\circ} 22' 9''$; the difference between the two distances is $1^{\circ} 46' 58''$, or, reduced to seconds, is 6418'', the logarithm of which, subtracted from the logarithm of three hours, or 10800'', gives for the proportional logarithm of the difference between the two distances 2260, as it is in the column headed *P. L. of Diff.* If the calculated *true distance* of the navigator lie between the two given distances above mentioned, as, for instance, if it should be $73^{\circ} 30' 47''$, the corresponding correction of the time would be found as follows:—

Distance in the Ephemeris at Midnight,	$72^{\circ} 35' 11''$
Calculated <i>True Distance</i> ,	$73^{\circ} 30' 47''$
Difference,	$0^{\circ} 55' 36''$
Prop. log. in Ephemeris,	2260
Prop. log. of Difference, $0^{\circ} 55' 36''$,	5102
Prop. log. of $1^{\text{h}} 33^{\text{m}} 33^{\text{s}}$.	2842

And this time is to be added to the time at the head of the column from which the distance of the Ephemeris was taken, which would make the time at Greenwich corresponding to the Navigator's True Distance $1^{\text{h}} 33^{\text{m}} 33^{\text{s}}$ on the morning of the 2d of March.

This method of getting the Greenwich time between two given times in the Ephemeris rests upon the supposition, that the variation between one distance and the next following is uniform and regular. But owing to the inequalities in the moon's motion, this is not the case; and it is, in consequence of this, necessary to apply to the Greenwich time obtained by the preceding method a small correction.

This correction, due to the second differences in the moon's motion, is given in the Table on page 28 of the Appendix, and is taken out and applied as follows.

The top of the Table is entered with the difference between that proportional logarithm of the Ephemeris which has already been used and the one next following, and the side of the Table is entered with the time which has been added to that at the head of the column of the Ephemeris, that is, the time given by the difference of the proportional logarithms at the close of the preceding paragraph; under the former, and opposite the latter, will be found the correction, in seconds of time, to be added to the time at Greenwich if the proportional logarithms are decreasing, but subtracted if they are increasing.

The Ephemeris of the Planets, from page 218 to page 241, consists of the apparent right ascension at Greenwich mean noon and its variation for one hour, the apparent declination at the same date and its variation for one hour, and the mean time of their meridian passage; and at the bottom of the page will be found the semidiameter and horizontal parallax for every fifth day of the month. The hourly variations belong to noon of the day on which they are given. The mode of correcting by means of the hourly variation for any time from noon has already been explained.

The Solar Coördinates for Greenwich mean noon, on pages 242 – 244, are added, and the Moon's Longitude and Latitude on pages 245 – 248.

• Finally, the Mean Places of the one hundred principal Fixed Stars for January 1, 1861, are given on pages 256 – 258.

When the latitude is to be deduced from the meridian altitude of one of these stars, its time of passing the meridian can be ascertained by taking the sum of the right ascension of the star, and the mean time of sidereal noon contained in the last column of page III. of each month. The right ascension of the star is, in fact, its hour-angle, or difference in time, from the sidereal noon, or 0^h. If, then, a vessel in longitude 45° West should wish to obtain the latitude by a meridian observation of a star, as, for example, α TAURI (*Aldebaran*), on the evening of January 1, 1861, the process for obtaining the time of meridian passage would be as follows:—

	h. m. s.
Mean Time of sidereal 0 ^h January 1, 1861,	5 14 40
Correction for Longitude omitted.	
Right Ascension of α TAURI (<i>Aldebaran</i>),	4 27 57
Time of star's meridian passage,	9 42 37

The instant of passage might be more accurately determined by making an allowance for the difference between mean solar and sidereal time, and by applying the correction for longitude; but the above is sufficiently near for the purpose for which it is wanted, which is, to know the period of meridian passage approximately, in order to identify the star if necessary, and to be in time with the observation. The navigator will perceive that the dates in this column of page III. are astronomical, and will observe the distinctions of time explained in the first part of this article; he will also remember that when the sum exceeds 24 hours, 24 hours are to be subtracted, and a unit is to be added to the day of the month.

The Sun's Right Ascension may also be used for finding the time of meridian passage of a star, as shown in BOWDITCH'S *Navigator*, p. 223.

THE ASTRONOMICAL PART.

THIS part is adapted to the meridian of Washington.

Obliquity of the Ecliptic, &c., p. 250.—On this page are given the apparent obliquity, the equation of equinoxes in longitude and right ascension, the precession of equinoxes in longitude, and the sun's aberration and horizontal parallax, for every ten days of the year; at the bottom of the page will be found the mean obliquity for the beginning of the year, the precession for the middle of the year, the logarithm of the precession in a sidereal day, and the logarithm of the precession in a solar day. On the same page, the mean longitude of the moon's ascending node is also given for every ten days, and at the bottom of the page its daily motion.

Fixed Stars.—The Logarithms *A, B, C, D*, for correcting the places of the Fixed Stars, are given for the mean midnight of every day of the year, and the constants of reduction for every five days. To these tables are added BESSEL's formulas of reduction, with PETERS' coefficients, and the notation of the catalogue of stars of the British Association.

The *mean* places of 100 principal Fixed Stars on January 1, 1861; the *apparent* places of α and δ Ursæ Minoris, at the time of the upper transit at Washington, for every day of the year; and the *apparent* places of the remaining principal stars for every ten days; together with a table giving the correction of 51 Cephei, σ Octantis, and λ Ursæ Minoris, for terms of nutation involving 2 ϵ ,—complete the subject of the Fixed Stars.

Solar Ephemeris.—In the Solar Ephemeris, given for Washington mean and apparent noon, the hourly motions in right ascension and declination are the motions at the instant of noon. Only the seconds of right ascension and declination are given for apparent noon, the degrees and minutes being usually the same as for mean noon.

The *Moon Culminations* and *Moon-culminating Stars* are given in two distinct lists. The list of Moon Culminations contains both the solar and sidereal dates of transit; the apparent right ascension is the right ascension of the limb, and the declination is the declination of the centre, at their respective periods of culmination. The form of the lists of moon-culminating stars has been somewhat changed. In the first volume of the Ephemeris, reference to the stars to be used in connection with the Moon was made by a figure, and the stars themselves were entered successively in the order of numbers. In the present volume these figures are dispensed with, and the proper star to be observed in connection with the transit of the moon's limb is determined by means of the sidereal dates, common to both lists. Each star occupies a separate column containing its right ascension to hundredths of seconds for every sidereal date throughout the year for which it is available, and also its declination and magnitude. The first column of each page contains the sidereal date, and the last the daily change in right ascension of the corresponding stars. It is hoped that the standard observatories will determine the place of each one of these stars once at least in the course of the year. The whole list has been taken from the Twelve-Year Catalogue.

The *Ephemeris of the Moon*, which follows, and the *Moon's Phases*, require no special observation. In the moon's ephemeris, as in that of the sun, the hourly motions belong to the instant for which they are given.

The ephemeris of the two interior planets is given for mean noon and the time of transit; and that of the exterior planets is given for sidereal noon and the time of transit. The place of a planet for any number of minutes t , from the nearest noon for which it is given, t being negative when the time precedes the noon, may be computed by the formula,

$$\text{Planet's R. A. (or Dec.)} = A + B t + C t^2,$$

in which $A = \text{R. A. (or Dec.) for the noon,}$
 $B = \text{the motion of R. A. (or Dec.) for 1 minute,}$
 or, more exactly, $= \text{the factor of } t, \text{ as given in the Ephemeris ;}$
 $C = \text{the factor of } t^2 = \text{factor for second differences.}$

The *Solar Coördinates* are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator, at the beginning of the year. In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:).

The *Planetary Coördinates* are referred to the mean equinox and ecliptic of the mean noon of the 2400,000th day of the Julian Period, and the dates for which they are given are counted from this epoch in mean solar days. They may be converted into days of the Julian Period by adding 2400,000. The columns $-\frac{k^2}{3}x$, &c. contain the quantities $-1600 m \frac{k^2}{3}x$, $-1600 m \frac{k^2}{3}y$, $-1600 m \frac{k^2}{3}z$, in which m denotes the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.2355614$.

Eclipses.—The *Tables of Data of the Solar Eclipses* are adapted to very accurate computation by the following formulas.

$$\begin{aligned} \text{Let } \phi &= \text{the latitude of the place,} \\ \lambda &= \text{its western longitude from Washington,} \\ \log e &= 8.9110835, \\ \log (1 - e^2) &= 9.9971066, \\ \sin \phi' &= e \sin \phi, \\ h &= \sec \phi' \cos \phi, \\ k &= (1 - e^2) \sec \phi' \sin \phi, \\ a &= A - h \sin (\mu - \lambda), \\ b &= B - Ek + Gh \cos (\mu - \lambda), \\ c &= -C + Fk - Hh \cos (\mu - \lambda), \\ m &= \sqrt{bc}. \end{aligned}$$

If the instant for computation were correctly chosen at the time of beginning or end of the eclipse, m would be exactly equal to a . If m be not equal to a , the instant for a new computation, which will be an approximation to the actual time of beginning or end, may be found by adding to the preceding time of computation an interval t , which may be obtained in seconds by the formulas,

$$\begin{aligned} \log \mu' &= 1.86167, \\ \tan \frac{1}{2} \psi &= \frac{c}{m} = \frac{m}{b}, \\ a' &= A' - \mu' h \cos (\mu - \lambda), \\ b' &= B' - \mu' G h \sin (\mu - \lambda), \\ t &= \frac{1000000 (m - a)}{a' + b' \cot \psi}; \end{aligned}$$

ψ must be taken of the same sign with a , and is a sufficiently near approximation to the angle of contact from the north towards the east. For the shadow of a total eclipse, ψ must be taken with a sign opposite that of a .

The magnitude of the eclipse is found by taking the difference (with regard to the signs) between the value of ψ at the beginning and its value at the end of the eclipse, and if this difference is denoted by 2θ , the number of digits eclipsed is

$$12 (1 + n) \sin^2 \frac{1}{2} \theta, \quad \text{or, } 12 (1 + n) \cos^2 \frac{1}{2} \theta,$$

according as θ is acute or obtuse; π is the ratio of the semidiameter of the moon to that of the sun.

The value of θ may also be obtained by the formulas

$$\tan \chi = \frac{b'}{a'}, \quad \theta = \psi + \chi,$$

(in which χ has the sign of b'); and the expression of t may be changed to

$$t = 1000000 \cdot \frac{m-a}{a'} \cdot \frac{\cos \chi \sin \psi}{\sin \theta}.$$

The following is an example of the computation of the end of the Eclipse of December 30, for the Observatory at Washington.

For Washington, $\phi = 38^\circ 53' 39''.3$

$\lambda = 0^\circ 0' 0''$

$\log \sin \phi = 9.7978801$

$\log \cos \phi = 9.8911505$

$\log \sin \phi' = 8.7089636$

$\log \sec \phi' = 0.0005692$

$\log k = 9.7955559$

$\log h = 9.8917197$

A first approximation may be made from the chart, and corrected by computation. In this way we obtain $20^h 36^m$ Washington mean time as a near approximation to the time of the end of the eclipse at Washington. For a nearer approximation, take from table (p. 410) for $20^h 36^m$

$A = - 0.13542$

$\log E = 9.962870$

$B = + 1.04771$

$\log F = 9.964630$

$C = - 0.04228$

$\log G = 9.598217 \pi$

$A' = +155.17$

$\log H = 9.588525 \pi$

$B' = + 27.28$

$\mu = 308^\circ 8' 43''.1$

Hence

$$\mu - \lambda = 308^\circ 8' 43''.1$$

$\log \cos (\mu - \lambda) = 9.790748$

$\log \sin (\mu - \lambda) = 9.895669 \pi$

$\log [h \cos (\mu - \lambda)] = 9.682468$

$\log [h \sin (\mu - \lambda)] = 9.787389 \pi$

$\log [G h \cos (\mu - \lambda)] = 9.280685 \pi$

$\log [H h \cos (\mu - \lambda)] = 9.270993 \pi$

$\log (E k) = 9.758426$

$\log F k = 9.760186$

$G h \cos (\mu - \lambda) = -0.19085$

$-H h \cos (\mu - \lambda) = + 0.18664$

$-E k = -0.57336$

$F k = + 0.57569$

$B = +1.04771$

$-C = + 0.04228$

$b = +0.28350$

$c = + 0.80461$

$\log b = 9.4525531$

$-h \sin (\mu - \lambda) = + 0.61290$

$\log c = 9.9055854$

$A = - 0.13542$

$\log m = 9.6790693$

$a = + 0.47748$

$\log \tan \frac{1}{2} \psi = 0.2265161$

$m = + 0.47761$

$\psi = +118^\circ 37'$

$m - a = + 0.00013$

$\log [\mu' h \cos (\mu - \lambda)] = 1.54414$

$\log [G \mu' h \sin (\mu - \lambda)] = 1.24728$

$-\mu' h \cos (\mu - \lambda) = - 35.01$

$-G \mu' h \sin (\mu - \lambda) = -17.67$

$a' = +120.16$

$b' = + 9.61$

$a' + b' \cot \psi = +114.92$

$\log b' = 0.9827$

$\log [10^1 (m - a)] = 2.1139$

$\log \cot \psi = 9.7369 \pi$

$\log [a' + b' \cot \psi] = 2.0604$

$b' \cot \psi = - 5.24$

$\log t = 0.0535$

$t = + 1.13$

Approximate time	20 36 0.00
t , the correction	+1.13
Washington mean time of end	20 36 1.13

Occultations.—The pages 413 to 435 inclusive are taken up with *Elements for Facilitating the Calculation of Occultations of Planets and Stars by the Moon*. These elements are given for all the stars to the fifth, and for some of the sixth magnitude, inclusive, contained in the British Association Catalogue, which can be occulted by the moon during the year 1861.

The several columns of these pages contain, — 1. the date; 2. the star's name; 3. the star's magnitude; 4. the limiting parallels of visibility; 5. Washington mean time of the moon's true conjunction with the star in right ascension; 6. Washington hour angle, in time, of the star at the time of true conjunction; 7. coördinate q at the time of true conjunction; 8. hourly variation p' of coördinate p ; 9. hourly variation q' of coördinate q ; 10. logarithmic sine of the star's declination; 11. logarithmic cosine of the star's declination.

Designating the time of true conjunction by the usual symbol, δ , we have, at this time, $T = \delta$, $h = H$, $p = 0$, and $q = Y$. For any other time during the occultation, we shall have $T = \delta + (t)$, $h = H +$ sidereal equivalent of (t) , $p = (t) p'$, and $q = Y + (t) q'$. The other elements are considered as constant for the occultation.

In the prediction of an occultation for a particular place, the principal objects of determination are, the instant of *immersion*, or of the star's disappearance behind the moon's limb; of *emersion*, or of the star's reappearance; and the points on the moon's border where these appearances take place.

The calculations are made according to the method of BESSEL, whose original paper on the subject may be found in SCHUMACHER'S *Astronomische Nachrichten*, Vol. VII. p. 1; also in the *Berliner Astronomisches Jahrbuch* for 1831, p. 257. The letters and numerals prefixed to the stars belonging to the group of the Pleiades, and the magnitudes of these stars, are taken from No. V. of BESSEL'S *Astronomische Untersuchungen*.

The process of computation is shown by the following equations:—

d = Longitude for Washington, of the place, + West, — East

ϕ = Geographical North Latitude of the place.

ϕ' = Geocentric North Latitude of the place.

r = Earth's radius at the place, or the distance of the observer's position from the earth's centre.

It is unnecessary to calculate ϕ' and r separately, as we have

$$r \sin \phi' = \frac{(1 - e^2) \sin \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}} \quad r \cos \phi' = \frac{\cos \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}}$$

in which e denotes the eccentricity of the earth's meridians.

The logarithms of $\frac{1 - e^2}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log A$, and of $\frac{1}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log B$, derived from $e = .081697$, according to the latest determination of BESSEL, may be taken from the following table, where the geographical latitude of the place is the argument.

ϕ	Log. A	Log. B
0	9.9971	0.0000
10	9.9971	0.0000
20	9.9973	0.0002
30	9.9975	0.0004
40	9.9977	0.0006
50	9.9979	0.0009
60	9.9982	0.0011
70	9.9984	0.0018

$$r \sin \phi' = A \sin \phi$$

$$r \cos \phi' = B \cos \phi$$

$$a = r \cos \phi' \sin (h - d)$$

$$b = r \cos \phi' \cos (h - d)$$

$$\log \lambda = 9.4192$$

$$u = a$$

$$u' = b \lambda$$

$$v = r \sin \phi' \cos D - b \sin D$$

$$v' = a \lambda \sin D$$

$$m \sin M = p - u$$

$$n \sin N = p' - u'$$

$$m \cos M = q - v$$

$$n \cos N = q' - v'$$

$$\log k = 9.4350$$

$$\cos \psi = \frac{m \sin (M - N)}{k}$$

$$Q = 90^\circ - N \mp \psi$$

$$t = -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n}$$

Upper signs for Immersion; under signs for Emersion.

$$c \sin C = u + t u'$$

$$c \cos C = v + t v'$$

$$V = Q + C$$

Mean solar time of the star's apparent contact with the moon's limb

$$= T - d + t$$

$$\text{Angle from North Point} = Q$$

$$\text{Angle from Vertex} = V$$

The angle ψ is to be taken out positive and less than 180° . If $\log m \sin (M - N)$ be greater than $\log k$, $\cos \psi$ will evidently be greater than 1, or impossible, and there will be no occultation, except in some rare instances where the moon's limb passes very close to the star, when $\log \cos \psi$ will result very near 0. In these cases, a recalculation should be made according to the method which follows, using

$$t = -\frac{m}{n} \cos (M - N),$$

which may give $\log m \sin (M - N)$ less than $\log k$, when the star will be occulted. On the other hand, it may happen that, in these cases of very near approach, a first determination may give a $\cos \psi$ less than 1, which a recalculation will show to be impossible. The angle ψ is then to be considered $= 0^\circ$ when $m \sin (M - N)$ is positive, and we shall have $Q = 90^\circ - N$. When $m \sin (M - N)$ is negative, $\psi = 180^\circ$, or $Q = 90^\circ - N + 180^\circ = 270^\circ - N$. We shall also have, at the time of nearest approach,

$$\text{star's distance from moon's limb} = \pi (m \sin (M - N) - .2723),$$

in which π is the moon's horizontal parallax.

By *Angle from North Point* is to be understood the arc included between the star when in contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the North Pole; and by *Angle from Vertex*, the arc between the star at contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the zenith. These angles are reckoned from the north point and from the vertex towards the *West* round the circumference of the moon's disc. For the image as seen in an inverting telescope, add to them 180° .

The results obtained by the above equations are only approximate, yet the computed times of immersion and emersion will usually be within one or two minutes of the truth. The error generally increases with the star's distance from the apparent path of the moon's centre, and may, in some cases, amount to several minutes. For an immersion, this error is not of much consequence; but for an emersion, especially of a small star, the time should be determined with greater precision. For this purpose u' and v' must be computed with

$$h' - d = h - d + \frac{1}{2} \mu,$$

u being the symbol by which we express the sidereal equivalent of t in these equations.

$$\begin{aligned} u' &= r \cos \phi' \lambda \cos (h' - d) \\ v' &= r \cos \phi' \lambda \sin (h' - d) \sin D. \end{aligned}$$

Then with these values of u' and v' , recompute N , n , ψ , and t , by means of

$$\begin{aligned} n \sin N &= p' - u' \\ n \cos N &= q' - v' \\ \cos \psi &= \frac{m \sin (M - N)}{k} \\ t &= -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n} \end{aligned}$$

using the M and m obtained by the first computation, and we shall have the time of contact $T - d + t$, generally within a few seconds of the truth.

As a check on the accuracy of the work, we might compute

$$\begin{aligned} u &= r \cos \phi' \sin (h - d + \mu) \\ v &= r \cos \phi' \cos D - r \cos \phi' \cos (h - d + \mu) \end{aligned}$$

and we should have

$$(p + t p' - u)^2 + (q + t q' - v)^2 = k^2 = 0.0741.$$

But if $m \sin M$, $m \cos M$, $\log n \sin N$, and $\log n \cos N$, have been correctly computed, we shall have the following shorter and more convenient check on the subsequent calculations for the time of contact:

$$(m \sin M + t n \sin N)^2 + (m \cos M + t n \cos N)^2 = k^2 = 0.0741.$$

The elements of computation, H , Y , etc., are given for the instant of the moon's true conjunction with the star in right ascension. It is desirable, however, in computing an occultation for a particular place, to assume a time for the calculation near to the time of the nearest approach of the moon's centre to the star, as seen at that place, and to reduce the elements to this assumed time. This time, for which the nearest tenth of an hour will be sufficiently accurate, will not differ greatly from the time of *apparent* conjunction, as affected by parallax, which may be determined approximately by the following equations. Let $T - d$ be the time of apparent conjunction; then

$$\begin{aligned} (t) &= \frac{\sin (H - d)}{p' \sec \phi - [9.4027] \cos (H - d)} \\ T - d &= \delta - d + (t). \end{aligned}$$

The elements corresponding to the time $T - d$ may then be obtained as follows:

$$\begin{aligned} h - d &= H - d + (\mu) \\ p &= (t) p' \\ q &= Y + (t) q' \end{aligned}$$

Where occultations are to be generally observed, as at astronomical stations, either temporary or permanent, the observer will find an advantage in looking over the list and selecting, beforehand, all those which may be visible at his station, by observing if his latitude be included between the *limiting parallels* for any given occultation, if the time ($T - d$) be favorable as regards the absence of daylight, and if the star's hour-angle ($h - d$) be not greater than its semidiurnal arc for the given latitude.

For obtaining the time

$$T - d = \delta - d + (t),$$

it will be well to tabulate the values of

$$(t) = \frac{\sin(H - d)}{p' \sec \phi - [9.4027] \cos(H - d)}$$

for every half-hour of ($H - d$) as far as the greatest semidiurnal arc computed for the latitude of the station with a declination of 30° ; and for all values of p' , using two decimal figures, from 0.50 to 0.60.

It will also be found advantageous to have tabulated values of

$$u = r \cos \phi' \sin(h - d)$$

$$u' = r \cos \phi' \lambda \cos(h - d)$$

which should be given for every minute (in time) of ($h - d$), from 0^h to 6^h . If ($h - d$) exceeds 6^h , the argument will be $12^h - (h - d)$, instead of ($h - d$). It will be seen by the equations that u will have the same sign as $\sin(h - d)$, and that u' will have the same sign as $\cos(h - d)$.

In the equation

$$v = r \sin \phi' \cos D - b \sin D$$

the term $r \sin \phi' \cos D$ may be tabulated for every tenth minute of declination, from 0° to 30° .

For a practical application of the preceding formulæ, we will make the calculations for an occultation of the star 26 Arietis, January 19, 1861, as it will appear at Ann Arbor, Michigan, in north latitude $42^\circ 16' 48'' = \phi$, and west longitude from Washington $0^h 27^m 12^s = d$. The data for the computation are given on page 413, and, with the latitude and longitude of the place, are as follows:—

January 19. 26 Arietis, $6\frac{1}{2}$.

$\phi + 42^\circ 16' 48''$	$H + 1^h 48^m 46^s$	$p' 0.5946$
$d + 0^h 27^m 12^s$	$d + 0^h 27^m 12^s$	$q' + 0.1644$
$\delta 8^\circ 14.0'$	$H - d + 1^h 21^m 34^s$	$\log \sin D + 9.5178$
$\delta - d 7^\circ 46.8'$	$Y + 0.3470$	$\log \cos D + 9.9751$

Calculation of the Time, $T - d$, and reduction of the elements of computation.

	$\log p' + 9.720$		$(t) + 0.7$
	$\log \sec \phi + 0.131$		
$\log p' \sec \phi =$	$\log (1) + 9.851$	(Reduced to hours and minutes)	$(t) + 0^h 42^m 0^s$
	$\log \text{constant } 9.403$	Sidereal equivalent for (t)	$(\mu) + 0^h 42^m 7^s$
	$\log \cos (H - d) + 9.972$		$H - d + 1^h 21^m 34^s$
$\log [9.403] \cos (H - d) =$	$\log (2) + 9.375$	$H - d + (\mu) =$	$h - d + 2^h 3^m 41^s$
	$(2) + .237$		$\delta - d 7^\circ 46.8'$
	$(1) + .710$	$\delta - d + (t) =$	$T - d 8^h 28.8^m$
$(1) - (2) =$	$(3) + .473$		$Y + 0.3470$
	$\log (3) + 9.675$	$0.7 \times 0.1644 =$	$(t) q' + 0.1151$
	$\log \sin (H - d) + 9.542$	$Y + (t) q' =$	$q + 0.4621$
$\log \frac{\sin (H - d)}{(3)} =$	$\log (t) + 9.867$	$(t) p' = 0.7 \times 0.5946 =$	$p + 0.3672$

Calculation of the times of *Immersion* and *Emersion*, etc.

[illegible]

Calculation of a more accurate time, etc. of *Emersion*.

Sidereal equiv. for $\frac{1}{2} t_2 =$		$h - d + 2 \frac{h}{3} \frac{m}{41}$	From first determination,	$M \quad 341^{\circ} 6'$
$h - d + \frac{1}{2} \mu_2 =$		$\frac{1}{2} \mu_2 + 21 \quad 3$		$N \quad 71 \quad 0$
		$h' - d + 2 \quad 24 \quad 44$		$M - N \quad 270 \quad 8$
				$90^{\circ} - N \quad 19 \quad 0$
		$\log \cos (h' - d) + 9.9069$		$\psi \quad 98 \quad 49$
		$\log r \cos \phi' + 9.8698$	For Emersion, $90^{\circ} - N + \psi =$	$Q \quad 117 \quad 49$
		$\log \lambda \quad 9.4192$		(1) — .0002
$\log r \cos \phi' \lambda \cos (h' - d) =$		$\log u' + 9.1959$		(2) + .6921
		$\log \sin (h' - d) + 9.7712$	(1) + (2) =	$t + .6919$
		$\log r \cos \phi' \lambda + 9.9800$		$\log t + 9.8400$
		$\log \sin D + 9.5178$		$\log n \sin N + 9.5653$
$\log r \cos \phi' \lambda \sin (h' - d) \sin D =$		$\log v' + 8.5780$		$\log n \sin N + 9.4053$
		$v' + .0378$		$\log n \cos N + 9.1024$
		$q' + .1644$		$\log n \cos N + 8.9424$
$q' - v' =$		$n \cos N + .1266$		$n \cos N + .0876$
		$u' + .1570$	From first determination,	$m \cos M + n \cos N =$
		$p' + .5946$		(3) .1271
$p' - u' =$		$n \sin N + .3676$		$n \sin N + .2543$
		$\log n \sin N + 9.5653$	From first determination,	$m \sin M -$
		$\log n \cos N + 9.1024$		(4) .2408
		$\log \tan N + 0.4629$		(4) ² .0530
		$\log \sin N + 9.9757$		(3) ² .0161
		$\log n + 9.5896$	(3) ² + (4) ² = $k^2 = 0.0741$,	Check .0741
From first determination,		$\log m + 8.6206$		$\log u' + 9.1959$
		$-\log \frac{m}{n} - 0.0310$		$\log t u' + 9.0359$
		$\log \cos (M - N) + 7.3668$		$\log v' + 8.5780$
		$\log \sin (M - N) - 0.0000$		$\log t v' + 8.4180$
		$\log m \sin (M - N) - 8.6206$		$t v' + .0262$
		$\log k \quad 9.4350$	From first determination,	$v + .4226$
$\log \frac{m \sin (M - N)}{k} =$		$\log \cos \psi - 9.1856$		$c \cos C + .4468$
		$\log \sin \psi + 9.9948$		$t u' + .1086$
		$\log k \sin \psi + 9.4208$	From first determination,	$u + .3807$
$\log \frac{k \sin \psi}{n} =$		$\log (2) + 9.8402$		$c \sin C + .4893$
				$\log c \sin C + 9.6896$
$-\log \frac{m}{n} \cos (M - N) =$		$\log (1) - 6.3978$		$\log c \cos C + 9.6520$
				$\log \tan C + 0.0376$
				$T - d \quad 8 \quad 98.8$
			(Reduced to hours and minutes,)	$t + 0 \quad 41.5$
EMERSION: Ann Arbor Mean Time,				$T - d + t \quad 9 \quad 10.3$
				$C + 47^{\circ} 29'$
Emersion Angle from North Point =				$Q \quad 117 \quad 49$
Emersion Angle from Vertex = $Q + V =$				$V \quad 165 \quad 18$

The last two pages of the Occultations contain a list of such Occultations as will be visible at Washington during the year 1861.

The Tables of *Jupiter's Satellites* embrace, —

A list of the occultations, eclipses, transits, and transits of shadows, in the order of the time of the occurrence of the phenomena for the satellites taken promiscuously. They are given for every month, accompanied with a diagram, constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipses for an inverting telescope.

A table containing the mean time of the geocentric superior conjunction, and the rectangu-

lar coördinates of the satellites corresponding to the time from the next preceding superior conjunction, at intervals of twenty minutes for the first satellite, of forty minutes for the second, of one hour and twenty minutes for the third, and of three hours for the fourth satellite. They are also given for the time of eclipse for the first, second, and third satellites at intervals of seven days, and for the fourth for every eclipse. They enable the astronomer to obtain the configurations at all times. They are given in seconds of arc.

The coördinates have their origin in the centre of the primary, and are referred to the major and minor axes of the apparent ellipse described by the path of the satellite.

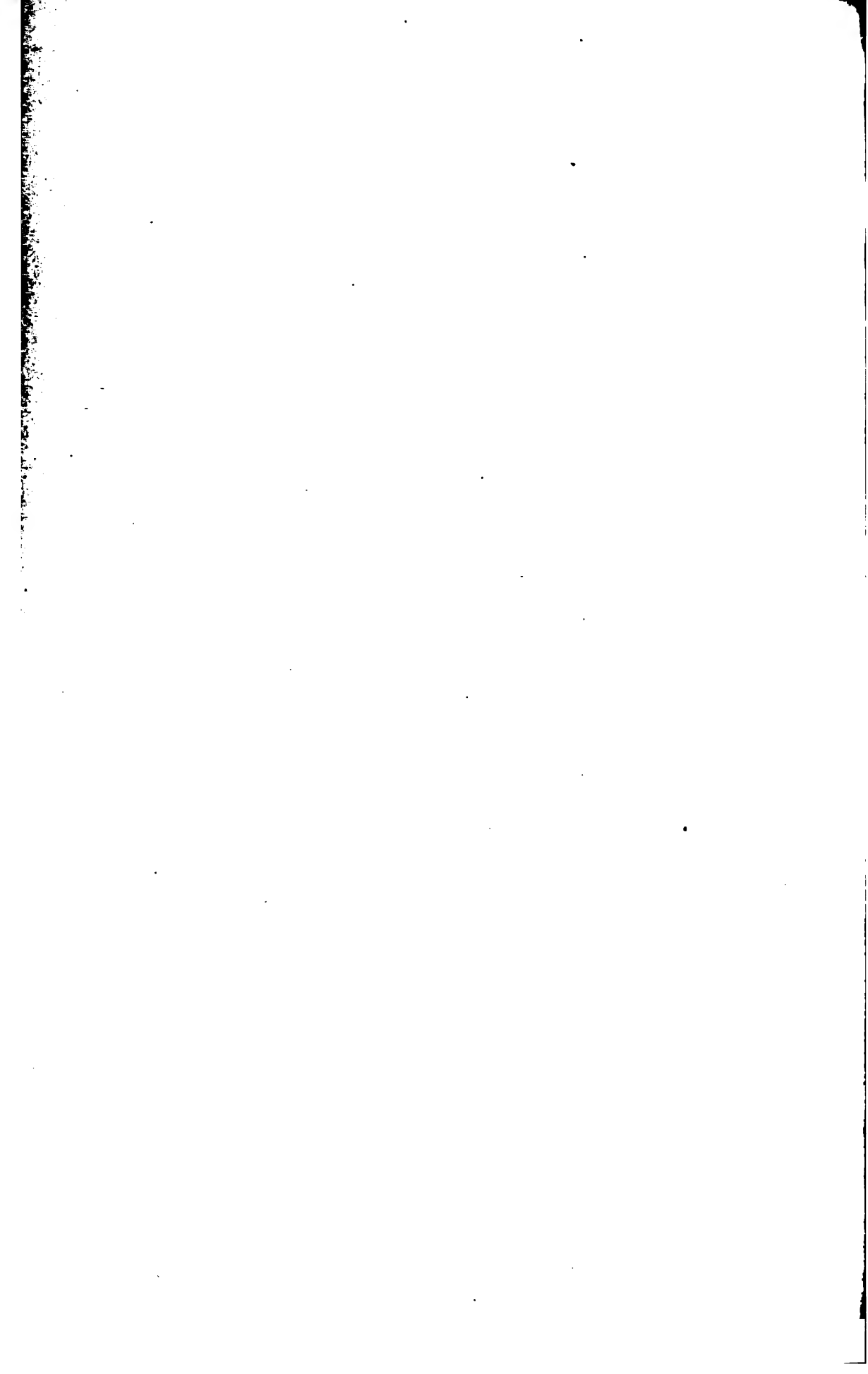
The major axis of this ellipse is constant, for the earth's mean place; but the minor axis takes all values from the positive and negative maxima to zero, owing to the changes in the earth's elevation above the plane of the satellite's orbit.

The values in the table correspond to the maximum value of the conjugate axis, as seen from the sun or that of the mean maximum for the earth (which is a constant value). Factors are given in an adjoining column, at intervals of seven days for the first, second, and third satellites, and seventeen days for the fourth, to reduce the above values to those corresponding to the axis for the time being; also for the same intervals, the angle of inclination of the northern semi-minor axis to the circle of declination.

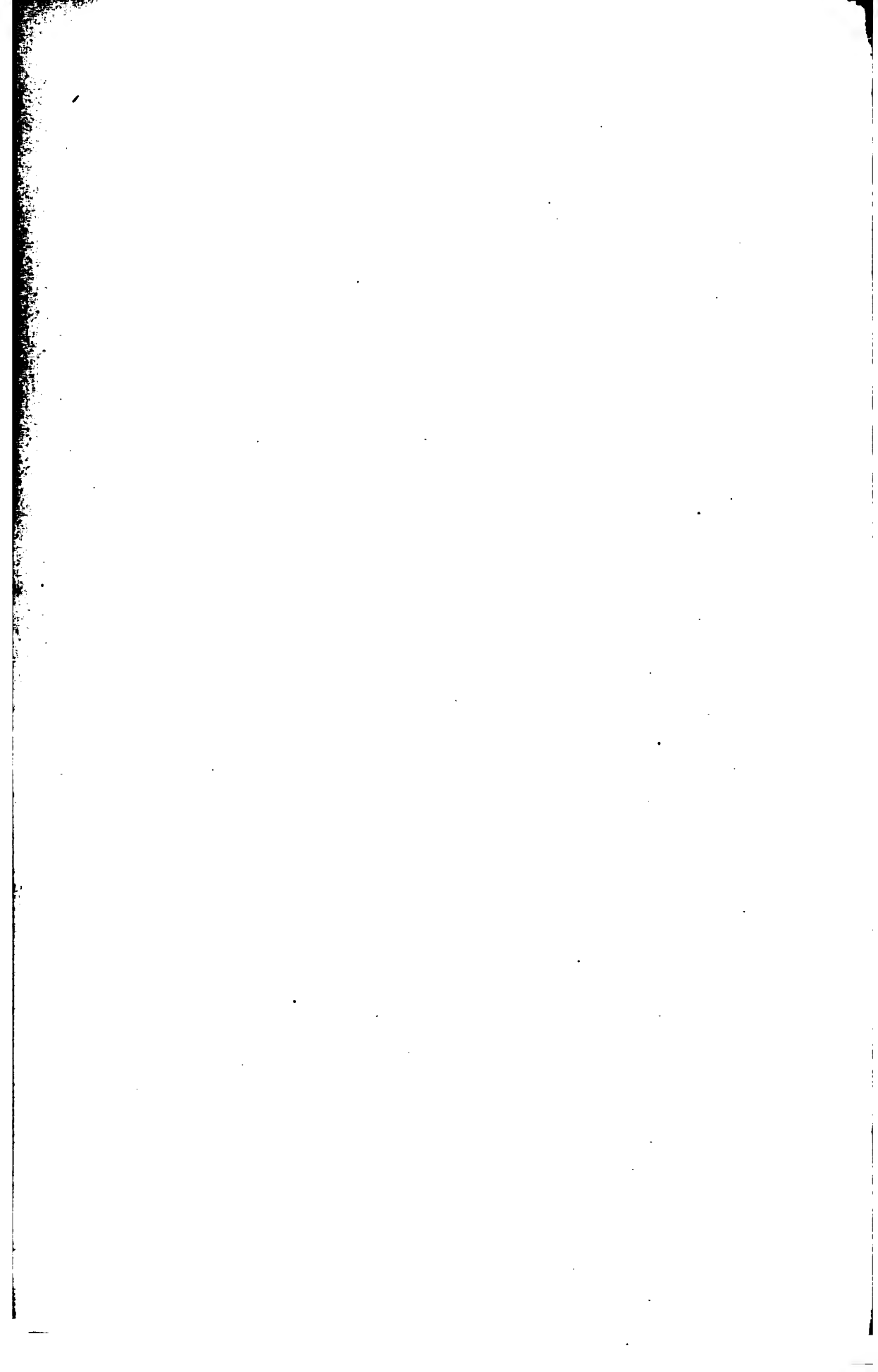
x is positive after superior conjunction, or on the east side of the planet, negative before superior conjunction, or on the west side. y will be positive north, negative south. The eclipses, occultations, &c. of the satellites, visible at Washington, that is, those which occur when the sun is 8° below and Jupiter 8° above the horizon, are distinguished by a *W.* placed after the name of the phase.

The *Appendix* contains an article on the construction of this work, similar to that of the preceding year.

It also contains tables of reduction from the equator to the ecliptic, and the reverse; a general table for the Libration of the Moon, constructed by means of the formulas on page 334, and furnishing the values to be employed in the computation of the moon's libration in latitude and longitude (see page 334); a table showing the moon's mean motion in longitude for sidereal intervals of time, carried out to tenths of minutes; a table of logarithms of small arcs in space and time; a table showing the correction required on account of second differences in the moon's motion, the use of which is explained in the preceding part of this article, page 488; a table for converting mean solar into sidereal time, and the reverse; and a table containing the corrections to be applied to the places of Polaris and δ Ursæ Minoris in the years 1857, 1858, and 1859, arising from the terms of nutation depending upon 2 ϵ .



A P P E N D I X .



CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1861.

THE Precession of the Equinoxes adopted in this volume is taken from STRUVE and PETERS; * it is,

$$\text{Precession} = 50''.2411 + 0''.0002268 t,$$

in which t is the number of years after 1800.

The Mean Obliquity of the Ecliptic is also taken from STRUVE and PETERS, and its value is, †

$$\text{Obliquity} = 23^\circ 27' 54''.22 - 0''.4645 t - 0''.0000014 t^2.$$

The constant of aberration is that of STRUVE, and is, ‡

$$\text{Aberration} = 20''.4451 \pm 0''.0111.$$

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulas given in his *Numerus Constans Nutationis*. § These formulas are reprinted in the volume of this ephemeris for 1855.

Of the Mean Places of 100 Fixed Stars, thirty-three have been taken from LE VERRIER's list of Fundamental Stars, *Annales de l'Observatoire Impériale de Paris*, Vol. II.; nine from a list of Circumpolar Stars prepared by Dr. GOULD, *U. S. Coast Survey Report*, 1855; and the remainder from the list of stars in the *English Nautical Almanac* for 1855, combined with that given in the *Astronomical Observations made during the Year 1846 at the National Observatory, Washington*.

The Apparent Places of the Fixed Stars have been obtained by means of PETERS' formulas, which are given on page 255.

The place of Sirius is corrected by the following formula, given by PETERS, for the variability of its motion in right ascension compared with those of β Orionis, α Orionis, and Procyon.

$$\text{Variation of right ascension} = 0''.101 + 0''.00072 t + 0''.170 \sin. (u + 92^\circ 18');$$

in which

* PETERS' *Numerus Constans Nutationis*, p. 71.

† Ibid., pp. 66 and 71.

‡ STRUVE's *Constant de l'Aberration*, p. 47.

§ PETERS' *Numerus Constans Nutationis*, pp. 46-48.

APPENDIX.

π = the eccentric anomaly from the inferior apsis. It is found from the elements,

Mean annual motion of Sirius in its orbit	= $7^{\circ}.3104 \pm 0^{\circ}.2162$
Period of its revolution	= $49^{\circ}.245 \pm 1^{\circ}.456$
Passage through the inferior apsis	= $1792.819 \pm 2^{\circ}.089$
Eccentricity	= 0.5647 ± 0.0627 .

The List of Moon-culminating Stars is large, and so arranged in a systematic form as to permit the observer a great range for selection.

The Ephemeris of the Sun is constructed from the Tables of HANSEN and OLUFSEN, Copenhagen, 1853. In the computation of the Sun's Geocentric Coördinates, regard has been had to the sun's latitude; the computation has been made by means of the formulas given in the *Construction of the Almanac for 1855*.

ENCKE's discussion of the Transits of Venus in 1761 and 1769, in his *Der Venusdurchgang von 1769, &c.*, has furnished the standard

Equatorial Horizontal Parallax at the Earth's Mean Distance = $8''.5776$.

The Sun's Semidiameter at the Earth's Mean Distance has been taken equal to $16' 2''$.

For reducing observations of different observers, the following corrections may be added:—

For Greenwich Mural Circle, H.	+ 0.21
“ “ “ “ H. B.	— 0.43
“ “ “ “ F.	— 0.86
“ “ “ “ E.	+ 0.17
“ “ “ “ R.	— 0.57
“ “ “ “ G.	— 0.18
“ “ “ “ I. H.	— 0.87
“ “ “ “ D.	— 0.61
“ “ “ “ W. R.	+ 0.49
“ “ “ “ P.	— 1.28
Königsberg Meridian Circle, Bessel	— 1.10
Dorpat “ “ W. Struve	— 1.36
Washington Mural Circle, Prof. Coffin	+ 1.00
“ “ “ Lieut. Page	+ 1.00
Washington Meridian Circle, Prof. Hubbard	— 0.41

The Ephemeris of the Moon has been constructed from PEIRCE's *Tables of the Moon*, with the *Tables of the Moon's Parallax*, constructed from WALKER's and ADAMS' formulas, and arranged as a Supplement to the first edition of PEIRCE's *Tables of the Moon*.

The Semidiameter of the Moon at the Earth's Mean Distance is taken to be $\frac{1}{10}$ part greater than that given by BURCKHARDT, although that given by BURCKHARDT is probably better adapted to the computation of eclipses and occultations.

CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Mercury has been constructed from the theory of LE VERRIER, published in the *Additions* to the *Connaissance des Temps* for 1848, without any alteration. Manuscript Tables have been computed from LE VERRIER's formulas for this purpose.

The Ephemeris of Venus has been derived from manuscript Tables, constructed from LINDENAU's Tables, in a form similar to that adopted for the Lunar Tables; applying AIRY's Long Equation and the corrections proceeding from the discussion, by the method of Least Squares, of Mr. HUGH BREEN's results contained in his paper on the *Corrections of LINDENAU's Elements of the Orbit of Venus, &c.*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XVIII.; and adopting the secular variations of the elements from LE VERRIER's *Memoir on the Determination of the Secular Inequalities of the Planets*, which appeared in the *Connaissance des Temps* for the year 1844. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0.

$$\begin{aligned} L &= 289^{\circ} 51' 53''.5 \\ \pi &= 129\ 32\ 59.6 + 49''.57459\ t. \\ \Omega &= 75\ 23\ 27.3 + 32.88424\ t. \\ i &= 3\ 23\ 34.6 + 0.04363\ t. \\ e &= 1410''.6847 - 0.11157\ t. \\ n &= 2106641.438 \\ a &= 0.7233323 \end{aligned}$$

The Ephemeris of Mars is derived from manuscript Tables constructed from LINDENAU's Tables in the same manner as the Tables of Venus. Mr. HUGH BREEN's results contained in his paper *On the Corrections of LINDENAU's Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and secular variations for Washington, 1855.0.

$$\begin{aligned} L &= 320^{\circ} 13' 33''.71 \\ \pi &= 333\ 23\ 17.80 + 65''.99145\ t. \\ \Omega &= 48\ 25\ 55.18 + 27.68294\ t. \\ i &= 1\ 51\ 2.20 - 0.02141\ t. \\ e &= 19238''.75 + 0.18549\ t. \\ n &= 689050.9023 \\ a &= 1.5236878 \end{aligned}$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from BOUVARD's Tables, with such changes as were required to make them correspond more nearly to the formulas.

The Ephemeris of Saturn is also derived from manuscript Tables constructed from the Tables of BOUVARD, with changes having the same object. The mass of Jupiter given by BESSEL has been adopted and used.

$$\text{This mass} = \frac{1}{1047.879 \pm 0.235} \text{ of the sun's mass.}$$

The following corrections of the elements have also been introduced for 1861:—

APPENDIX.

corr. mean long.	= +4".9
corr. long. of node	= -143".4
corr. inclination	= -5".7.

The Ephemeris of Uranus is derived from the elliptical portion of BOUVARD'S Tables, with LE VERRIER'S corrections and perturbations caused by Jupiter and Saturn, contained in his *Recherches sur les Mouvements de la Planète Herschel (dite Uranus)*, published in the *Connaissance des Temps* for 1849, and also PEIRCE'S corrections and perturbations arising from the influence of Neptune,

The combined corrections of the elements deduced by PEIRCE for January 1, 1800, are as follows:—

corr. mean distance	= +0.000942
corr. mean motion	= -1."13560
corr. eccentricity	= -0.0003626
corr. long. of per.	= +8252".4
corr. long. of epoch	= +2575".4.

The Ephemeris of Neptune is derived from PEIRCE'S theory and WALKER'S orbit.

The eclipses and elongations of Jupiter's Satellites are computed from DAMOISEAU'S Tables.

The vertical semidiameters of the Planets are computed from the following values:—

	Vertical Semidiameter.	Log. Dist.	Authority
Mercury	3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	8.546 ± 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the mural circle.
Mars	2.842 ± 0.057	0.25	
Jupiter	18.78 ± 0.067	0.70	
Saturn	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	

To correspond to the apparent semidiameters observed with the Washington mural circle, all the semidiameters, except those of Mercury, computed from these values, must be increased by a constant quantity = 0".57.

The apparent elements of Saturn's Rings are computed from BESSEL'S data, except those for BOND'S dusky ring.

The elements of the eclipse are adapted to the neat and simple modification of BESSEL'S formulas, suggested by T. HENRY SAFFORD, Jr.

The elements adapted to BESSEL'S formulas are given for all occultations of stars greater than those of the sixth magnitude.

The Heliocentric Coördinates of the Planets are given for the computation of perturbations, and the following are the values of the masses, that of the Sun being unity:—

Mercury	$\frac{1}{4865751}$	ENCKE, <i>A. N.</i> , No. 443.
Venus	$\frac{1}{390000}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 115.

CONSTRUCTION OF THE ALMANAC.

The Earth	$\frac{1}{354936}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 26.
Mars	$\frac{1}{2680637}$	BURCKHARDT, <i>Conn. des Temps</i> , 1816, p. 343.
Jupiter	$\frac{1}{1047.879 \pm 0.235}$	BESSEL, <i>Die Masse des Jupiter</i> , p. 64.
Saturn	$\frac{1}{3501.6}$	BESSEL, <i>Comptes Rendus</i> , 1841.
Uranus	$\frac{1}{24905}$	LAMONT, <i>Mem. Ast. Soc.</i> , Vol. XI p. 54.
Neptune	$\frac{1}{18780}$	PEIRCE, <i>Am. Ac. Proc.</i> , Vol. I. p. 333.

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the stereotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner.

The Sun has been computed by Mr. EASTWOOD; the Ephemeris of the Moon, by Mr. RUNKLE, Mr. OLIVER, Mr. WRIGHT, and Professor KERR; the Moon Culminations, by Mr. LOOMIS; and the Lunar Distances, by Mr. LOOMIS, Mr. NEWCOMB, and Professor VAN VLECK. Mercury has been computed by Mr. BRADFORD, Venus by Miss MITCHELL, Mars by Professor BARDWELL, Jupiter by Professor KENDALL, Saturn by Professor VAN VLECK, Uranus by Mr. FERREL, and Neptune by Professor KENDALL. The Fixed Stars and the General Constants for Reduction have been computed by Mr. SPRAGUE, and the Occultations, by Mr. DOWNES. The Eclipses have been computed and the Charts projected by Mr. WRIGHT. The Table of Geographical Positions of the Principal Observatories has been prepared by Dr. GOULD.

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

<i>l</i>	<i>l</i>	<i>A</i>	<i>a</i>	Diff.	Log. <i>a</i>	Diff.	<i>b</i>	Log. <i>b</i>	<i>B</i>	Diff.	<i>l</i>	<i>l</i>
<i>o</i>	<i>h. m.</i>	<i>o</i>	<i>o</i>						<i>o</i>		<i>h. m.</i>	<i>o</i>
0	0 0	0 0.0	0.3981	1	9.6000	1	0.9173	9.9625	0 0.0	26.0	12 0	180
1	0 4	0 5.4	0.3980	2	9.5999	2	0.9174	9.9626	0 26.0	26.1	11 56	179
2	0 8	0 10.8	0.3978	3	9.5997	3	0.9175	9.9626	0 52.1	26.0	11 52	178
3	0 12	0 16.2	0.3975	4	9.5994	5	0.9176	9.9627	1 18.1	25.9	11 48	177
4	0 16	0 21.5	0.3971	5	9.5989	6	0.9178	9.9627	1 44.0	25.9	11 44	176
5	0 20	0 26.9	0.3966	7	9.5983	7	0.9180	9.9628	2 9.9	25.9	11 40	175
6	0 24	0 32.2	0.3959	8	9.5976	9	0.9183	9.9630	2 35.8	25.8	11 36	174
7	0 28	0 37.4	0.3951	9	9.5967	10	0.9186	9.9631	3 1.6	25.8	11 32	173
8	0 32	0 42.6	0.3942	10	9.5957	11	0.9190	9.9633	3 27.4	25.6	11 28	172
9	0 36	0 47.7	0.3932	13	9.5946	13	0.9195	9.9635	3 53.0	25.6	11 24	171
10	0 40	0 52.8	0.3920	13	9.5933	14	0.9200	9.9638	4 18.6	25.4	11 20	170
11	0 44	0 57.8	0.3907	13	9.5919	15	0.9205	9.9640	4 44.0	25.3	11 16	169
12	0 48	1 2.7	0.3894	15	9.5904	17	0.9211	9.9643	5 9.3	25.2	11 12	168
13	0 52	1 7.5	0.3879	16	9.5887	18	0.9217	9.9646	5 34.5	25.1	11 8	167
14	0 56	1 12.3	0.3863	17	9.5869	20	0.9224	9.9649	5 59.6	24.9	11 4	166
15	1 0	1 17.0	0.3846	19	9.5849	21	0.9231	9.9652	6 24.5	24.8	11 0	165
16	1 4	1 21.5	0.3827	20	9.5828	22	0.9239	9.9656	6 49.3	24.6	10 56	164
17	1 8	1 25.9	0.3807	21	9.5806	24	0.9247	9.9660	7 13.9	24.4	10 52	163
18	1 12	1 30.2	0.3786	22	9.5782	25	0.9256	9.9664	7 38.3	24.2	10 48	162
19	1 16	1 34.4	0.3764	23	9.5757	27	0.9265	9.9668	8 2.5	24.0	10 44	161
20	1 20	1 38.5	0.3741	24	9.5730	29	0.9274	9.9673	8 26.5	23.9	10 40	160
21	1 24	1 42.4	0.3717	26	9.5701	30	0.9284	9.9677	8 50.4	23.6	10 36	159
22	1 28	1 46.2	0.3691	27	9.5671	31	0.9294	9.9682	9 14.0	23.4	10 32	158
23	1 32	1 49.9	0.3664	27	9.5640	33	0.9304	9.9687	9 37.4	23.2	10 28	157
24	1 36	1 53.4	0.3637	29	9.5607	35	0.9315	9.9692	10 0.6	22.9	10 24	156
25	1 40	1 56.7	0.3608	30	9.5572	36	0.9326	9.9697	10 23.5	22.7	10 20	155
26	1 44	1 59.9	0.3578	31	9.5536	38	0.9338	9.9703	10 46.2	22.5	10 16	154
27	1 48	2 2.9	0.3547	32	9.5498	39	0.9350	9.9708	11 8.7	22.2	10 12	153
28	1 52	2 5.8	0.3515	33	9.5459	41	0.9362	9.9714	11 30.9	21.9	10 8	152
29	1 56	2 8.5	0.3482	34	9.5418	43	0.9374	9.9719	11 52.8	21.7	10 4	151
30	2 0	2 11.1	0.3448	35	9.5375	45	0.9387	9.9725	12 14.5	21.4	10 0	150
31	2 4	2 13.5	0.3413	37	9.5330	46	0.9400	9.9731	12 35.9	21.1	9 56	149
32	2 8	2 15.7	0.3376	38	9.5284	48	0.9413	9.9737	12 57.0	20.8	9 52	148
33	2 12	2 17.7	0.3338	38	9.5236	51	0.9426	9.9743	13 17.8	20.6	9 48	147
34	2 16	2 19.6	0.3300	39	9.5185	52	0.9440	9.9750	13 38.4	20.3	9 44	146
35	2 20	2 21.3	0.3261	40	9.5133	54	0.9453	9.9756	13 58.6	20.0	9 40	145
36	2 24	2 22.8	0.3221	41	9.5079	56	0.9467	9.9762	14 18.6	19.6	9 36	144
37	2 28	2 24.1	0.3180	43	9.5023	58	0.9481	9.9768	14 38.2	19.3	9 32	143
38	2 32	2 25.2	0.3137	44	9.4965	60	0.9495	9.9775	14 57.5	19.0	9 28	142
39	2 36	2 26.2	0.3093	44	9.4905	63	0.9509	9.9781	15 16.5	18.6	9 24	141
40	2 40	2 27.0	0.3049	45	9.4842	65	0.9524	9.9788	15 35.1	18.4	9 20	140
41	2 44	2 27.6	0.3004	46	9.4777	67	0.9538	9.9794	15 53.5	18.0	9 16	139
42	2 48	2 28.0	0.2958	47	9.4710	69	0.9552	9.9801	16 11.5	17.7	9 12	138
43	2 52	2 28.2	0.2911	47	9.4641	72	0.9566	9.9807	16 29.2	17.3	9 8	137
44	2 56	2 28.2	0.2864	49	9.4569	74	0.9581	9.9814	16 46.5	17.0	9 4	136
45	3 0	2 28.1	0.2815	50	9.4495	78	0.9595	9.9820	17 3.5	16.7	9 0	135
46	3 4	2 27.8	0.2765	50	9.4417	80	0.9610	9.9827	17 20.2	16.3	8 56	134
47	3 8	2 27.3	0.2715	51	9.4337	82	0.9625	9.9834	17 36.5	15.9	8 52	133
48	3 12	2 26.6	0.2664	52	9.4255	86	0.9639	9.9840	17 52.4	15.6	8 48	132
49	3 16	2 25.8	0.2612	53	9.4169	89	0.9653	9.9847	18 8.0	15.3	8 44	131
50	3 20	2 24.8	0.2559	54	9.4080	92	0.9667	9.9853	18 23.3	14.9	8 40	130
51	3 24	2 23.6	0.2505	54	9.3988	95	0.9681	9.9859	18 38.2	14.5	8 36	129
52	3 28	2 22.2	0.2451	55	9.3893	99	0.9695	9.9865	18 52.7	14.2	8 32	128
53	3 32	2 20.7	0.2396	56	9.3794	102	0.9709	9.9872	19 6.9	13.8	8 28	127
54	3 36	2 19.0	0.2340	57	9.3692	106	0.9722	9.9878	19 20.7	13.4	8 24	126
55	3 40	2 17.1	0.2283	57	9.3586	111	0.9736	9.9884	19 34.1	13.1	8 20	125

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

<i>k</i>	<i>k</i>	<i>A</i>	<i>a</i>	Diff.	Log. <i>a</i>	Diff.	<i>b</i>	Log. <i>b</i>	<i>B</i>	Diff.	<i>k</i>	<i>k</i>
°	h. m.	°							°	h. m.	°	
56	3 44	2 15.1	0.2226	58	9.3475	114	0.9749	9.9890	19 47.2	12.7	8 16	124
57	3 48	2 13.0	0.2168	59	9.3361	119	0.9762	9.9895	19 59.9	12.3	8 12	123
58	3 52	2 10.7	0.2109	59	9.3242	124	0.9775	9.9901	20 12.2	12.0	8 8	122
59	3 56	2 8.2	0.2050	60	9.3118	129	0.9788	9.9907	20 24.2	11.6	8 4	121
60	4 0	2 5.6	0.1990	60	9.2989	134	0.9800	9.9912	20 35.8	11.2	8 0	120
61	4 4	2 2.8	0.1930	61	9.2855	139	0.9812	9.9918	20 47.0	10.9	7 56	119
62	4 8	1 59.9	0.1896	62	9.2716	146	0.9824	9.9923	20 57.9	10.4	7 52	118
63	4 12	1 56.9	0.1807	62	9.2570	152	0.9836	9.9928	21 8.3	10.1	7 48	117
64	4 16	1 53.7	0.1745	63	9.2418	159	0.9847	9.9933	21 18.4	9.7	7 44	116
65	4 20	1 50.4	0.1682	63	9.2259	166	0.9858	9.9938	21 28.1	9.4	7 40	115
66	4 24	1 47.0	0.1619	64	9.2093	175	0.9868	9.9942	21 37.5	8.9	7 36	114
67	4 28	1 43.5	0.1555	64	9.1918	183	0.9878	9.9947	21 46.4	8.6	7 32	113
68	4 32	1 39.8	0.1491	64	9.1735	192	0.9888	9.9951	21 55.0	8.2	7 28	112
69	4 36	1 36.1	0.1427	65	9.1543	203	0.9898	9.9955	22 3.2	7.9	7 24	111
70	4 40	1 32.2	0.1362	66	9.1340	214	0.9907	9.9959	22 11.1	7.4	7 20	110
71	4 44	1 28.2	0.1296	66	9.1126	227	0.9916	9.9963	22 18.5	7.1	7 16	109
72	4 48	1 24.2	0.1230	66	9.0899	240	0.9924	9.9967	22 25.6	6.7	7 12	108
73	4 52	1 20.0	0.1164	67	9.0659	256	0.9932	9.9970	22 32.3	6.3	7 8	107
74	4 56	1 15.7	0.1097	67	9.0403	273	0.9940	9.9974	22 38.6	5.9	7 4	106
75	5 0	1 11.4	0.1030	67	9.0130	294	0.9947	9.9977	22 44.5	5.6	7 0	105
76	5 4	1 7.0	0.0963	67	8.9836	315	0.9954	9.9980	22 50.1	5.1	6 56	104
77	5 8	1 2.5	0.0896	68	8.9521	342	0.9960	9.9982	22 55.2	4.8	6 52	103
78	5 12	0 58.0	0.0828	68	8.9179	373	0.9966	9.9985	23 0.0	4.4	6 48	102
79	5 16	0 53.4	0.0760	69	8.8806	410	0.9971	9.9987	23 4.4	4.0	6 44	101
80	5 20	0 48.7	0.0691	68	8.8396	453	0.9976	9.9990	23 8.4	3.6	6 40	100
81	5 24	0 44.0	0.0623	69	8.7943	508	0.9981	9.9992	23 12.0	3.3	6 36	99
82	5 28	0 39.2	0.0554	69	8.7435	576	0.9985	9.9993	23 15.3	2.8	6 32	98
83	5 32	0 34.4	0.0485	69	8.6859	667	0.9988	9.9995	23 18.1	2.5	6 28	97
84	5 36	0 29.6	0.0416	69	8.6192	789	0.9991	9.9996	23 20.6	2.1	6 24	96
85	5 40	0 24.7	0.0347	69	8.5403	967	0.9994	9.9997	23 22.7	1.7	6 20	95
86	5 44	0 19.8	0.0278	69	8.4436	1248	0.9996	9.9998	23 24.4	1.3	6 16	94
87	5 48	0 14.9	0.0209	70	8.3188	1760	0.9998	9.9999	23 25.7	1.0	6 12	93
88	5 52	0 9.9	0.0139	69	8.1428	3010	0.9999	0.0000	23 26.7	0.6	6 8	92
89	5 56	0 5.0	0.0070	70	7.8418		1.0000	0.0000	23 27.3	0.2	6 4	91
90	6 0	0 0.0	0.0000				1.0000	0.0000	23 27.5		6 0	90

This table is computed for an obliquity of 23° 27' 30".

The argument *k* is either the longitude or the right ascension, or their excess above 180° or 12h.

Right ascension (*a*) and declination (*δ*) are converted into longitude (*λ*) and latitude (*β*) by the formulæ

$$k = a \text{ or } = a - 12^h.$$

$$\tan. p = a \tan. (\delta - B)$$

$$\tan. \beta = b \tan. (\delta - B) \cos. p$$

$$\lambda = a + A + p$$

in which the sign of *a* is that of cos. *a*

the sign of *B* is that of sin. *a*

the sign of *A* is that of tan. *a*

Longitude (*λ*) and latitude (*β*) are converted into right ascension and declination by the formulæ

$$k = \lambda = \lambda - 180^\circ$$

$$\tan. g = a \tan. (\beta + B)$$

$$\tan. \delta = b \tan. (\beta + B) \cos. g$$

$$a = \lambda + A - g$$

in which the sign of *a* is that of cos. *λ*

the sign of *B* is that of sin. *λ*

the sign of *A* is that of tan. *λ*

The following approximate formulæ can be used when *β* is less than 10°.

$$\beta = b (\delta - B)$$

$$\lambda = a + A + a (\delta - B) \sec. \beta$$

and the factor sec. *β* can be neglected when *β* is less than 4°.

MOON'S LIBRATION.

TABLE FOR THE LIBRATION OF THE MOON.

$\Omega - \lambda$	$\Delta \lambda$	a	B	$\Omega - \lambda$	$\Omega - \lambda$	$\Delta \lambda$	a	B	$\Omega - \lambda$
0	0.0	39	0 0.0	180	0	0.6	56	1 3.9	134
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					

$\Delta \lambda$ has the sign of $\tan. (\Omega - \lambda)$

a has the sign of $\cos. (\Omega - \lambda)$

B has the sign of $\sin. (\Omega - \lambda)$

When $\Omega - \lambda$ exceeds 180° the table is to be entered with $(\Omega - \lambda) - 180^\circ$ as the argument in the column $\Omega - \lambda$.

MOON'S MEAN MOTION.

MOON'S MEAN MOTION IN LONGITUDE FOR SIDEREAL INTERVALS.					
Day.	☾'s Motion in Longitude.	Minutes.	☾'s Motion in Longitude.	Minutes.	☾'s Motion in Longitude.
				30	16.4
1	13 8.4	1	0.5	31	17.0
2	26 16.9	2	1.1	32	17.5
3	39 25.3	3	1.6	33	18.1
4	52 33.7	4	2.2	34	18.6
5	65 42.1	5	2.7	35	19.2
6	78 50.6	6	3.3	36	19.7
7	91 59.0	7	3.8	37	20.3
8	105 7.4	8	4.4	38	20.8
9	118 15.8	9	4.9	39	21.4
10	131 24.3	10	5.5	40	21.9
Hour.		11	6.0	41	22.4
1	0 32.9	12	6.6	42	23.0
2	1 5.7	13	7.1	43	23.5
3	1 38.6	14	7.7	44	24.1
		15	8.2	45	24.6
4	2 11.3	16	8.8	46	25.2
5	2 44.3	17	9.3	47	25.7
6	3 17.1	18	9.9	48	26.3
7	3 50.0	19	10.4	49	26.8
8	4 22.8	20	11.0	50	27.4
9	4 55.7	21	11.5	51	27.9
10	5 28.5	22	12.0	52	28.5
11	6 1.4	23	12.5	53	29.0
12	6 34.3	24	13.1	54	29.6
13	7 7.1	25	13.6	55	30.1
14	7 39.9	26	14.2	56	30.7
15	8 12.8	27	14.7	57	31.2
16	8 45.6	28	15.3	58	31.8
17	9 18.5	29	15.9	59	32.3
18	9 51.3	30	16.4	60	32.9
				Seconds.	
19	10 24.2			10	0.1
20	10 57.0			20	0.2
21	11 29.9			30	0.3
22	12 2.7			40	0.4
23	12 35.6			50	0.5
24	13 8.4			60	0.5

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0 0	0.0000	0.0000	0.3010	0.4771	0.6021	0.6990	0.7782	0.8451	0.9081	0.9542
0 10	1.0000	1.0414	1.0792	1.1139	1.1461	1.1761	1.2041	1.2304	1.2553	1.2788
0 20	1.3010	1.3222	1.3424	1.3617	1.3802	1.3979	1.4150	1.4314	1.4472	1.4624
0 30	1.4771	1.4914	1.5051	1.5185	1.5315	1.5441	1.5563	1.5682	1.5798	1.5911
0 40	1.6021	1.6128	1.6232	1.6335	1.6435	1.6532	1.6628	1.6721	1.6812	1.6902
0 50	1.6990	1.7076	1.7160	1.7243	1.7324	1.7404	1.7482	1.7559	1.7634	1.7709
0 1 0	1.7782	1.7853	1.7924	1.7993	1.8062	1.8129	1.8195	1.8261	1.8325	1.8388
0 1 10	1.8451	1.8513	1.8573	1.8633	1.8692	1.8751	1.8808	1.8865	1.8921	1.8976
0 1 20	1.9031	1.9085	1.9138	1.9191	1.9243	1.9294	1.9345	1.9395	1.9445	1.9494
0 1 30	1.9542	1.9589	1.9638	1.9685	1.9731	1.9777	1.9823	1.9868	1.9912	1.9956
0 1 40	2.0000	2.0043	2.0086	2.0128	2.0170	2.0212	2.0253	2.0294	2.0334	2.0374
0 1 50	2.0414	2.0453	2.0492	2.0531	2.0569	2.0607	2.0645	2.0682	2.0719	2.0755
0 2 0	2.0792	2.0828	2.0864	2.0899	2.0934	2.0969	2.1004	2.1038	2.1072	2.1106
0 2 10	2.1139	2.1173	2.1206	2.1239	2.1271	2.1303	2.1335	2.1367	2.1399	2.1430
0 2 20	2.1461	2.1492	2.1523	2.1553	2.1584	2.1614	2.1644	2.1673	2.1703	2.1732
0 2 30	2.1761	2.1790	2.1818	2.1847	2.1875	2.1903	2.1931	2.1959	2.1987	2.2014
0 2 40	2.2041	2.2068	2.2095	2.2122	2.2148	2.2175	2.2201	2.2227	2.2253	2.2279
0 2 50	2.2304	2.2330	2.2355	2.2380	2.2405	2.2430	2.2455	2.2480	2.2504	2.2529
0 3 0	2.2553	2.2577	2.2601	2.2625	2.2648	2.2672	2.2695	2.2718	2.2742	2.2765
0 3 10	2.2788	2.2810	2.2833	2.2856	2.2878	2.2900	2.2923	2.2945	2.2967	2.2989
0 3 20	2.3010	2.3032	2.3054	2.3075	2.3096	2.3118	2.3139	2.3160	2.3181	2.3201
0 3 30	2.3222	2.3243	2.3263	2.3284	2.3304	2.3324	2.3345	2.3365	2.3385	2.3404
0 3 40	2.3424	2.3444	2.3464	2.3483	2.3502	2.3522	2.3541	2.3560	2.3579	2.3598
0 3 50	2.3617	2.3636	2.3655	2.3674	2.3692	2.3711	2.3729	2.3747	2.3766	2.3784
0 4 0	2.3802	2.3820	2.3838	2.3856	2.3874	2.3892	2.3909	2.3927	2.3945	2.3962
0 4 10	2.3979	2.3997	2.4014	2.4031	2.4048	2.4065	2.4082	2.4099	2.4116	2.4133
0 4 20	2.4150	2.4166	2.4183	2.4200	2.4216	2.4232	2.4249	2.4265	2.4281	2.4298
0 4 30	2.4314	2.4330	2.4346	2.4362	2.4378	2.4393	2.4409	2.4425	2.4440	2.4456
0 4 40	2.4472	2.4487	2.4502	2.4518	2.4533	2.4548	2.4564	2.4579	2.4594	2.4609
0 4 50	2.4624	2.4639	2.4654	2.4669	2.4683	2.4698	2.4713	2.4728	2.4742	2.4757
0 5 0	2.4771	2.4786	2.4800	2.4814	2.4829	2.4843	2.4857	2.4871	2.4886	2.4900
0 5 10	2.4914	2.4928	2.4942	2.4955	2.4969	2.4983	2.4997	2.5011	2.5024	2.5038
0 5 20	2.5051	2.5065	2.5079	2.5092	2.5105	2.5119	2.5132	2.5145	2.5159	2.5172
0 5 30	2.5185	2.5198	2.5211	2.5224	2.5237	2.5250	2.5263	2.5276	2.5289	2.5302
0 5 40	2.5315	2.5328	2.5340	2.5353	2.5366	2.5378	2.5391	2.5403	2.5416	2.5428
0 5 50	2.5441	2.5453	2.5465	2.5478	2.5490	2.5502	2.5514	2.5527	2.5539	2.5551
0 6 0	2.5563	2.5575	2.5587	2.5599	2.5611	2.5623	2.5635	2.5647	2.5658	2.5670
0 6 10	2.5682	2.5694	2.5705	2.5717	2.5729	2.5740	2.5752	2.5763	2.5775	2.5786
0 6 20	2.5798	2.5809	2.5821	2.5832	2.5843	2.5855	2.5866	2.5877	2.5888	2.5899
0 6 30	2.5911	2.5922	2.5933	2.5944	2.5955	2.5966	2.5977	2.5988	2.5999	2.6010
0 6 40	2.6021	2.6031	2.6042	2.6053	2.6064	2.6075	2.6085	2.6096	2.6107	2.6117
0 6 50	2.6128	2.6138	2.6149	2.6160	2.6170	2.6180	2.6191	2.6201	2.6212	2.6222
0 7 0	2.6232	2.6243	2.6253	2.6263	2.6274	2.6284	2.6294	2.6304	2.6314	2.6325
0 7 10	2.6335	2.6345	2.6355	2.6365	2.6375	2.6385	2.6395	2.6405	2.6415	2.6425
0 7 20	2.6435	2.6444	2.6454	2.6464	2.6474	2.6484	2.6493	2.6503	2.6513	2.6522
0 7 30	2.6532	2.6542	2.6551	2.6561	2.6571	2.6580	2.6590	2.6599	2.6609	2.6618
0 7 40	2.6628	2.6637	2.6646	2.6656	2.6665	2.6675	2.6684	2.6693	2.6702	2.6712
0 7 50	2.6721	2.6730	2.6739	2.6749	2.6758	2.6767	2.6776	2.6785	2.6794	2.6803
0 8 0	2.6812	2.6821	2.6830	2.6839	2.6848	2.6857	2.6866	2.6875	2.6884	2.6893
0 8 10	2.6902	2.6911	2.6920	2.6928	2.6937	2.6946	2.6955	2.6964	2.6972	2.6981
0 8 20	2.6990	2.6998	2.7007	2.7016	2.7024	2.7033	2.7042	2.7050	2.7059	2.7067
0 8 30	2.7076	2.7084	2.7093	2.7101	2.7110	2.7118	2.7126	2.7135	2.7143	2.7152
0 8 40	2.7160	2.7168	2.7177	2.7185	2.7193	2.7202	2.7210	2.7218	2.7226	2.7235
0 8 50	2.7243	2.7251	2.7259	2.7267	2.7275	2.7284	2.7292	2.7300	2.7308	2.7316
0 9 0	2.7324	2.7332	2.7340	2.7348	2.7356	2.7364	2.7372	2.7380	2.7388	2.7396
0 9 10	2.7404	2.7412	2.7419	2.7427	2.7435	2.7443	2.7451	2.7459	2.7466	2.7474
0 9 20	2.7482	2.7490	2.7497	2.7505	2.7513	2.7520	2.7528	2.7536	2.7543	2.7551
0 9 30	2.7559	2.7566	2.7574	2.7582	2.7589	2.7597	2.7604	2.7612	2.7619	2.7627
0 9 40	2.7634	2.7642	2.7649	2.7657	2.7664	2.7672	2.7679	2.7686	2.7694	2.7701
0 9 50	2.7709	2.7716	2.7723	2.7731	2.7738	2.7745	2.7752	2.7760	2.7767	2.7774

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 10' 0"	2.7782	2.7789	2.7796	2.7803	2.7810	2.7818	2.7825	2.7832	2.7839	2.7846
10 10	2.7853	2.7860	2.7868	2.7875	2.7882	2.7889	2.7896	2.7903	2.7910	2.7917
10 20	2.7924	2.7931	2.7938	2.7945	2.7952	2.7959	2.7966	2.7973	2.7980	2.7987
10 30	2.7993	2.8000	2.8007	2.8014	2.8021	2.8028	2.8035	2.8041	2.8048	2.8055
10 40	2.8062	2.8069	2.8075	2.8082	2.8089	2.8096	2.8102	2.8109	2.8116	2.8122
10 50	2.8129	2.8136	2.8142	2.8149	2.8156	2.8162	2.8169	2.8176	2.8182	2.8189
0 11 0	2.8195	2.8202	2.8209	2.8215	2.8222	2.8228	2.8235	2.8241	2.8248	2.8254
11 10	2.8261	2.8267	2.8274	2.8280	2.8287	2.8293	2.8299	2.8306	2.8312	2.8319
11 20	2.8325	2.8331	2.8338	2.8344	2.8351	2.8357	2.8363	2.8370	2.8376	2.8382
11 30	2.8388	2.8395	2.8401	2.8407	2.8414	2.8420	2.8426	2.8432	2.8439	2.8445
11 40	2.8451	2.8457	2.8463	2.8470	2.8476	2.8482	2.8488	2.8494	2.8500	2.8506
11 50	2.8513	2.8519	2.8525	2.8531	2.8537	2.8543	2.8549	2.8555	2.8561	2.8567
0 12 0	2.8573	2.8579	2.8585	2.8591	2.8597	2.8603	2.8609	2.8615	2.8621	2.8627
12 10	2.8633	2.8639	2.8645	2.8651	2.8657	2.8663	2.8669	2.8675	2.8681	2.8686
12 20	2.8692	2.8698	2.8704	2.8710	2.8716	2.8722	2.8727	2.8733	2.8739	2.8745
12 30	2.8751	2.8756	2.8762	2.8768	2.8774	2.8779	2.8785	2.8791	2.8797	2.8802
12 40	2.8808	2.8814	2.8820	2.8825	2.8831	2.8837	2.8842	2.8848	2.8854	2.8859
12 50	2.8865	2.8871	2.8876	2.8882	2.8887	2.8893	2.8899	2.8904	2.8910	2.8915
0 13 0	2.8921	2.8927	2.8932	2.8938	2.8943	2.8949	2.8954	2.8960	2.8965	2.8971
13 10	2.8976	2.8982	2.8987	2.8993	2.8998	2.9004	2.9009	2.9015	2.9020	2.9025
13 20	2.9031	2.9036	2.9042	2.9047	2.9053	2.9058	2.9063	2.9069	2.9074	2.9079
13 30	2.9085	2.9090	2.9096	2.9101	2.9106	2.9112	2.9117	2.9122	2.9128	2.9133
13 40	2.9138	2.9143	2.9149	2.9154	2.9159	2.9165	2.9170	2.9175	2.9180	2.9186
13 50	2.9191	2.9196	2.9201	2.9206	2.9212	2.9217	2.9222	2.9227	2.9232	2.9238
0 14 0	2.9243	2.9248	2.9253	2.9258	2.9263	2.9269	2.9274	2.9279	2.9284	2.9289
14 10	2.9294	2.9299	2.9304	2.9309	2.9315	2.9320	2.9325	2.9330	2.9335	2.9340
14 20	2.9345	2.9350	2.9355	2.9360	2.9365	2.9370	2.9375	2.9380	2.9385	2.9390
14 30	2.9395	2.9400	2.9405	2.9410	2.9415	2.9420	2.9425	2.9430	2.9435	2.9440
14 40	2.9445	2.9450	2.9455	2.9460	2.9465	2.9469	2.9474	2.9479	2.9484	2.9489
14 50	2.9494	2.9499	2.9504	2.9509	2.9513	2.9518	2.9523	2.9528	2.9533	2.9538
0 15 0	2.9542	2.9547	2.9552	2.9557	2.9562	2.9566	2.9571	2.9576	2.9581	2.9586
15 10	2.9590	2.9595	2.9600	2.9605	2.9609	2.9614	2.9619	2.9624	2.9628	2.9633
15 20	2.9638	2.9643	2.9647	2.9652	2.9657	2.9661	2.9666	2.9671	2.9675	2.9680
15 30	2.9685	2.9689	2.9694	2.9699	2.9703	2.9708	2.9713	2.9717	2.9722	2.9727
15 40	2.9731	2.9736	2.9741	2.9745	2.9750	2.9754	2.9759	2.9763	2.9768	2.9773
15 50	2.9777	2.9782	2.9786	2.9791	2.9795	2.9800	2.9805	2.9809	2.9814	2.9818
0 16 0	2.9823	2.9827	2.9832	2.9836	2.9841	2.9845	2.9850	2.9854	2.9859	2.9863
16 10	2.9868	2.9872	2.9877	2.9881	2.9886	2.9890	2.9894	2.9899	2.9903	2.9908
16 20	2.9912	2.9917	2.9921	2.9926	2.9930	2.9934	2.9939	2.9943	2.9948	2.9952
16 30	2.9956	2.9961	2.9965	2.9969	2.9974	2.9978	2.9983	2.9987	2.9991	2.9996
16 40	3.0000	3.0004	3.0009	3.0013	3.0017	3.0022	3.0026	3.0030	3.0035	3.0039
16 50	3.0043	3.0048	3.0052	3.0056	3.0060	3.0065	3.0069	3.0073	3.0077	3.0082
0 17 0	3.0086	3.0090	3.0095	3.0099	3.0103	3.0107	3.0111	3.0116	3.0120	3.0124
17 10	3.0128	3.0133	3.0137	3.0141	3.0145	3.0149	3.0154	3.0158	3.0162	3.0166
17 20	3.0170	3.0175	3.0179	3.0183	3.0187	3.0191	3.0195	3.0199	3.0204	3.0208
17 30	3.0212	3.0216	3.0220	3.0224	3.0228	3.0233	3.0237	3.0241	3.0245	3.0249
17 40	3.0253	3.0257	3.0261	3.0265	3.0269	3.0273	3.0278	3.0282	3.0286	3.0290
17 50	3.0294	3.0298	3.0302	3.0306	3.0310	3.0314	3.0318	3.0322	3.0326	3.0330
0 18 0	3.0334	3.0338	3.0342	3.0346	3.0350	3.0354	3.0358	3.0362	3.0366	3.0370
18 10	3.0374	3.0378	3.0382	3.0386	3.0390	3.0394	3.0398	3.0402	3.0406	3.0410
18 20	3.0414	3.0418	3.0422	3.0426	3.0430	3.0434	3.0438	3.0441	3.0445	3.0449
18 30	3.0453	3.0457	3.0461	3.0465	3.0469	3.0473	3.0477	3.0481	3.0484	3.0488
18 40	3.0492	3.0496	3.0500	3.0504	3.0508	3.0512	3.0515	3.0519	3.0523	3.0527
18 50	3.0531	3.0535	3.0538	3.0542	3.0546	3.0550	3.0554	3.0558	3.0561	3.0565
0 19 0	3.0569	3.0573	3.0577	3.0580	3.0584	3.0588	3.0592	3.0596	3.0599	3.0603
19 10	3.0607	3.0611	3.0615	3.0618	3.0622	3.0626	3.0630	3.0633	3.0637	3.0641
19 20	3.0645	3.0648	3.0652	3.0656	3.0660	3.0663	3.0667	3.0671	3.0674	3.0678
19 30	3.0682	3.0686	3.0689	3.0693	3.0697	3.0700	3.0704	3.0708	3.0711	3.0715
19 40	3.0719	3.0722	3.0726	3.0730	3.0734	3.0737	3.0741	3.0745	3.0748	3.0752
19 50	3.0756	3.0759	3.0763	3.0766	3.0770	3.0774	3.0777	3.0781	3.0785	3.0788

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 20' 0"	3.0792	3.0795	3.0799	3.0803	3.0806	3.0810	3.0813	3.0817	3.0821	3.0824
20 10	3.0828	3.0831	3.0835	3.0839	3.0842	3.0846	3.0849	3.0853	3.0856	3.0860
20 20	3.0864	3.0867	3.0871	3.0874	3.0878	3.0881	3.0885	3.0888	3.0892	3.0896
20 30	3.0899	3.0903	3.0906	3.0910	3.0913	3.0917	3.0920	3.0924	3.0927	3.0931
20 40	3.0934	3.0938	3.0941	3.0945	3.0948	3.0952	3.0955	3.0959	3.0962	3.0966
20 50	3.0969	3.0973	3.0976	3.0980	3.0983	3.0986	3.0990	3.0993	3.0997	3.1000
0 21 0	3.1004	3.1007	3.1011	3.1014	3.1017	3.1021	3.1024	3.1028	3.1031	3.1035
21 10	3.1038	3.1041	3.1045	3.1048	3.1052	3.1055	3.1059	3.1062	3.1065	3.1069
21 20	3.1072	3.1075	3.1079	3.1082	3.1086	3.1089	3.1092	3.1096	3.1099	3.1103
21 30	3.1106	3.1109	3.1113	3.1116	3.1119	3.1123	3.1126	3.1129	3.1133	3.1136
21 40	3.1139	3.1143	3.1146	3.1149	3.1153	3.1156	3.1159	3.1163	3.1166	3.1169
21 50	3.1173	3.1176	3.1179	3.1183	3.1186	3.1189	3.1193	3.1196	3.1199	3.1202
0 22 0	3.1206	3.1209	3.1212	3.1216	3.1219	3.1222	3.1225	3.1229	3.1232	3.1235
22 10	3.1239	3.1242	3.1245	3.1248	3.1252	3.1255	3.1258	3.1261	3.1265	3.1268
22 20	3.1271	3.1274	3.1278	3.1281	3.1284	3.1287	3.1290	3.1294	3.1297	3.1300
22 30	3.1303	3.1307	3.1310	3.1313	3.1316	3.1319	3.1323	3.1326	3.1329	3.1332
22 40	3.1335	3.1339	3.1342	3.1345	3.1348	3.1351	3.1355	3.1358	3.1361	3.1364
22 50	3.1367	3.1370	3.1374	3.1377	3.1380	3.1383	3.1386	3.1389	3.1392	3.1396
0 23 0	3.1399	3.1402	3.1405	3.1408	3.1411	3.1414	3.1418	3.1421	3.1424	3.1427
23 10	3.1430	3.1433	3.1436	3.1440	3.1443	3.1446	3.1449	3.1452	3.1455	3.1458
23 20	3.1461	3.1464	3.1467	3.1471	3.1474	3.1477	3.1480	3.1483	3.1486	3.1489
23 30	3.1492	3.1495	3.1498	3.1501	3.1504	3.1508	3.1511	3.1514	3.1517	3.1520
23 40	3.1523	3.1526	3.1529	3.1532	3.1535	3.1538	3.1541	3.1544	3.1547	3.1550
23 50	3.1553	3.1556	3.1559	3.1562	3.1565	3.1569	3.1572	3.1575	3.1578	3.1581
0 24 0	3.1584	3.1587	3.1590	3.1593	3.1596	3.1599	3.1602	3.1605	3.1608	3.1611
24 10	3.1614	3.1617	3.1620	3.1623	3.1626	3.1629	3.1632	3.1635	3.1638	3.1641
24 20	3.1644	3.1647	3.1649	3.1652	3.1655	3.1658	3.1661	3.1664	3.1667	3.1670
24 30	3.1673	3.1676	3.1679	3.1682	3.1685	3.1688	3.1691	3.1694	3.1697	3.1700
24 40	3.1703	3.1706	3.1708	3.1711	3.1714	3.1717	3.1720	3.1723	3.1726	3.1729
24 50	3.1732	3.1735	3.1738	3.1741	3.1744	3.1746	3.1749	3.1752	3.1755	3.1758
0 25 0	3.1761	3.1764	3.1767	3.1770	3.1772	3.1775	3.1778	3.1781	3.1784	3.1787
25 10	3.1790	3.1793	3.1796	3.1798	3.1801	3.1804	3.1807	3.1810	3.1813	3.1816
25 20	3.1818	3.1821	3.1824	3.1827	3.1830	3.1833	3.1836	3.1838	3.1841	3.1844
25 30	3.1847	3.1850	3.1853	3.1855	3.1858	3.1861	3.1864	3.1867	3.1870	3.1872
25 40	3.1875	3.1878	3.1881	3.1884	3.1886	3.1889	3.1892	3.1895	3.1898	3.1901
25 50	3.1903	3.1906	3.1909	3.1912	3.1915	3.1917	3.1920	3.1923	3.1926	3.1928
0 26 0	3.1931	3.1934	3.1937	3.1940	3.1942	3.1945	3.1948	3.1951	3.1953	3.1956
26 10	3.1959	3.1962	3.1965	3.1967	3.1970	3.1973	3.1976	3.1978	3.1981	3.1984
26 20	3.1987	3.1989	3.1992	3.1995	3.1998	3.2000	3.2003	3.2006	3.2009	3.2011
26 30	3.2014	3.2017	3.2019	3.2022	3.2025	3.2028	3.2030	3.2033	3.2036	3.2038
26 40	3.2041	3.2044	3.2047	3.2049	3.2052	3.2055	3.2057	3.2060	3.2063	3.2066
26 50	3.2068	3.2071	3.2074	3.2076	3.2079	3.2082	3.2084	3.2087	3.2090	3.2093
0 27 0	3.2095	3.2098	3.2101	3.2103	3.2106	3.2109	3.2111	3.2114	3.2117	3.2119
27 10	3.2122	3.2125	3.2127	3.2130	3.2133	3.2135	3.2138	3.2140	3.2143	3.2146
27 20	3.2148	3.2151	3.2154	3.2156	3.2159	3.2162	3.2164	3.2167	3.2170	3.2172
27 30	3.2175	3.2177	3.2180	3.2183	3.2185	3.2188	3.2191	3.2193	3.2196	3.2198
27 40	3.2201	3.2204	3.2206	3.2209	3.2212	3.2214	3.2217	3.2219	3.2222	3.2225
27 50	3.2227	3.2230	3.2232	3.2235	3.2238	3.2240	3.2243	3.2245	3.2248	3.2250
0 28 0	3.2253	3.2256	3.2258	3.2261	3.2263	3.2266	3.2269	3.2271	3.2274	3.2276
28 10	3.2279	3.2281	3.2284	3.2287	3.2289	3.2292	3.2294	3.2297	3.2299	3.2302
28 20	3.2304	3.2307	3.2310	3.2312	3.2315	3.2317	3.2320	3.2322	3.2325	3.2327
28 30	3.2330	3.2333	3.2335	3.2338	3.2340	3.2343	3.2345	3.2348	3.2350	3.2353
28 40	3.2355	3.2358	3.2360	3.2363	3.2365	3.2368	3.2370	3.2373	3.2375	3.2378
28 50	3.2380	3.2383	3.2385	3.2388	3.2390	3.2393	3.2395	3.2398	3.2400	3.2403
0 29 0	3.2405	3.2408	3.2410	3.2413	3.2415	3.2418	3.2420	3.2423	3.2425	3.2428
29 10	3.2430	3.2433	3.2435	3.2438	3.2440	3.2443	3.2445	3.2448	3.2450	3.2453
29 20	3.2455	3.2458	3.2460	3.2463	3.2465	3.2467	3.2470	3.2472	3.2475	3.2477
29 30	3.2480	3.2482	3.2485	3.2487	3.2490	3.2492	3.2494	3.2497	3.2499	3.2502
29 40	3.2504	3.2507	3.2509	3.2512	3.2514	3.2516	3.2519	3.2521	3.2524	3.2526
29 50	3.2529	3.2531	3.2533	3.2536	3.2538	3.2541	3.2543	3.2545	3.2548	3.2550

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 30' 0"	3.2553	3.2555	3.2558	3.2560	3.2562	3.2565	3.2567	3.2570	3.2572	3.2574
30 10	3.2577	3.2579	3.2582	3.2584	3.2586	3.2589	3.2591	3.2594	3.2596	3.2598
30 20	3.2601	3.2603	3.2605	3.2608	3.2610	3.2613	3.2615	3.2617	3.2620	3.2622
30 30	3.2625	3.2627	3.2629	3.2632	3.2634	3.2636	3.2639	3.2641	3.2643	3.2646
30 40	3.2648	3.2651	3.2653	3.2655	3.2658	3.2660	3.2662	3.2665	3.2667	3.2669
30 50	3.2672	3.2674	3.2676	3.2679	3.2681	3.2683	3.2686	3.2688	3.2690	3.2693
0 31 0	3.2695	3.2697	3.2700	3.2702	3.2704	3.2707	3.2709	3.2711	3.2714	3.2716
31 10	3.2718	3.2721	3.2723	3.2725	3.2728	3.2730	3.2732	3.2735	3.2737	3.2739
31 20	3.2742	3.2744	3.2746	3.2749	3.2751	3.2753	3.2755	3.2758	3.2760	3.2762
31 30	3.2765	3.2767	3.2769	3.2772	3.2774	3.2776	3.2778	3.2781	3.2783	3.2785
31 40	3.2788	3.2790	3.2792	3.2794	3.2797	3.2799	3.2801	3.2804	3.2806	3.2808
31 50	3.2810	3.2813	3.2815	3.2817	3.2819	3.2822	3.2824	3.2826	3.2828	3.2831
0 32 0	3.2833	3.2835	3.2838	3.2840	3.2842	3.2844	3.2847	3.2849	3.2851	3.2853
32 10	3.2856	3.2858	3.2860	3.2862	3.2865	3.2867	3.2869	3.2871	3.2874	3.2876
32 20	3.2878	3.2880	3.2882	3.2885	3.2887	3.2889	3.2891	3.2894	3.2896	3.2898
32 30	3.2900	3.2903	3.2905	3.2907	3.2909	3.2911	3.2914	3.2916	3.2918	3.2920
32 40	3.2923	3.2925	3.2927	3.2929	3.2931	3.2934	3.2936	3.2938	3.2940	3.2942
32 50	3.2945	3.2947	3.2949	3.2951	3.2953	3.2956	3.2958	3.2960	3.2962	3.2964
0 33 0	3.2967	3.2969	3.2971	3.2973	3.2975	3.2978	3.2980	3.2982	3.2984	3.2986
33 10	3.2989	3.2991	3.2993	3.2995	3.2997	3.2999	3.3002	3.3004	3.3006	3.3008
33 20	3.3010	3.3012	3.3015	3.3017	3.3019	3.3021	3.3023	3.3025	3.3028	3.3030
33 30	3.3032	3.3034	3.3036	3.3038	3.3041	3.3043	3.3045	3.3047	3.3049	3.3051
33 40	3.3054	3.3056	3.3058	3.3060	3.3062	3.3064	3.3066	3.3069	3.3071	3.3073
33 50	3.3075	3.3077	3.3079	3.3081	3.3084	3.3086	3.3088	3.3090	3.3092	3.3094
0 34 0	3.3096	3.3098	3.3101	3.3103	3.3105	3.3107	3.3109	3.3111	3.3113	3.3115
34 10	3.3118	3.3120	3.3122	3.3124	3.3126	3.3128	3.3130	3.3132	3.3134	3.3137
34 20	3.3139	3.3141	3.3143	3.3145	3.3147	3.3149	3.3151	3.3153	3.3156	3.3158
34 30	3.3160	3.3162	3.3164	3.3166	3.3168	3.3170	3.3172	3.3174	3.3176	3.3179
34 40	3.3181	3.3183	3.3185	3.3187	3.3189	3.3191	3.3193	3.3195	3.3197	3.3199
34 50	3.3201	3.3204	3.3206	3.3208	3.3210	3.3212	3.3214	3.3216	3.3218	3.3220
0 35 0	3.3222	3.3224	3.3226	3.3228	3.3230	3.3233	3.3235	3.3237	3.3239	3.3241
35 10	3.3243	3.3245	3.3247	3.3249	3.3251	3.3253	3.3255	3.3257	3.3259	3.3261
35 20	3.3263	3.3265	3.3267	3.3269	3.3272	3.3274	3.3276	3.3278	3.3280	3.3282
35 30	3.3284	3.3286	3.3288	3.3290	3.3292	3.3294	3.3296	3.3298	3.3300	3.3302
35 40	3.3304	3.3306	3.3308	3.3310	3.3312	3.3314	3.3316	3.3318	3.3320	3.3322
35 50	3.3324	3.3326	3.3328	3.3330	3.3332	3.3334	3.3336	3.3339	3.3341	3.3343
0 36 0	3.3345	3.3347	3.3349	3.3351	3.3353	3.3356	3.3357	3.3359	3.3361	3.3363
36 10	3.3365	3.3367	3.3369	3.3371	3.3373	3.3375	3.3377	3.3379	3.3381	3.3383
36 20	3.3385	3.3387	3.3389	3.3391	3.3393	3.3395	3.3397	3.3398	3.3400	3.3402
36 30	3.3404	3.3406	3.3408	3.3410	3.3412	3.3414	3.3416	3.3418	3.3420	3.3422
36 40	3.3424	3.3426	3.3428	3.3430	3.3432	3.3434	3.3436	3.3438	3.3440	3.3442
36 50	3.3444	3.3446	3.3448	3.3450	3.3452	3.3454	3.3456	3.3458	3.3460	3.3462
0 37 0	3.3464	3.3465	3.3467	3.3469	3.3471	3.3473	3.3475	3.3477	3.3479	3.3481
37 10	3.3483	3.3485	3.3487	3.3489	3.3491	3.3493	3.3495	3.3497	3.3499	3.3501
37 20	3.3502	3.3504	3.3506	3.3508	3.3510	3.3512	3.3514	3.3516	3.3518	3.3520
37 30	3.3522	3.3524	3.3526	3.3528	3.3530	3.3531	3.3533	3.3535	3.3537	3.3539
37 40	3.3541	3.3543	3.3545	3.3547	3.3549	3.3551	3.3553	3.3555	3.3556	3.3558
37 50	3.3560	3.3562	3.3564	3.3566	3.3568	3.3570	3.3572	3.3574	3.3576	3.3577
0 38 0	3.3579	3.3581	3.3583	3.3585	3.3587	3.3589	3.3591	3.3593	3.3595	3.3596
38 10	3.3598	3.3600	3.3602	3.3604	3.3606	3.3608	3.3610	3.3612	3.3614	3.3615
38 20	3.3617	3.3619	3.3621	3.3623	3.3625	3.3627	3.3629	3.3630	3.3632	3.3634
38 30	3.3636	3.3638	3.3640	3.3642	3.3644	3.3646	3.3647	3.3649	3.3651	3.3653
38 40	3.3655	3.3657	3.3659	3.3660	3.3662	3.3664	3.3666	3.3668	3.3670	3.3672
38 50	3.3674	3.3675	3.3677	3.3679	3.3681	3.3683	3.3685	3.3687	3.3688	3.3690
0 39 0	3.3692	3.3694	3.3696	3.3698	3.3700	3.3701	3.3703	3.3705	3.3707	3.3709
39 10	3.3711	3.3713	3.3714	3.3716	3.3718	3.3720	3.3722	3.3724	3.3725	3.3727
39 20	3.3729	3.3731	3.3733	3.3735	3.3736	3.3738	3.3740	3.3742	3.3744	3.3746
39 30	3.3747	3.3749	3.3751	3.3753	3.3755	3.3757	3.3758	3.3760	3.3762	3.3764
39 40	3.3766	3.3768	3.3769	3.3771	3.3773	3.3775	3.3777	3.3779	3.3780	3.3782
39 50	3.3784	3.3786	3.3788	3.3789	3.3791	3.3793	3.3795	3.3797	3.3798	3.3800

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 40' 0"	3.3802	3.3804	3.3806	3.3808	3.3809	3.3811	3.3813	3.3815	3.3817	3.3818
40 10	3.3820	3.3822	3.3824	3.3826	3.3827	3.3829	3.3831	3.3833	3.3835	3.3836
40 20	3.3838	3.3840	3.3842	3.3844	3.3845	3.3847	3.3849	3.3851	3.3852	3.3854
40 30	3.3856	3.3858	3.3860	3.3861	3.3863	3.3865	3.3867	3.3869	3.3870	3.3872
40 40	3.3874	3.3876	3.3877	3.3879	3.3881	3.3883	3.3885	3.3886	3.3888	3.3890
40 50	3.3892	3.3893	3.3895	3.3897	3.3899	3.3901	3.3902	3.3904	3.3906	3.3908
41 0	3.3909	3.3911	3.3913	3.3915	3.3916	3.3918	3.3920	3.3922	3.3923	3.3925
41 10	3.3927	3.3929	3.3930	3.3932	3.3934	3.3936	3.3938	3.3939	3.3941	3.3943
41 20	3.3945	3.3946	3.3948	3.3950	3.3952	3.3953	3.3955	3.3957	3.3959	3.3960
41 30	3.3962	3.3964	3.3965	3.3967	3.3969	3.3971	3.3972	3.3974	3.3976	3.3978
41 40	3.3979	3.3981	3.3983	3.3985	3.3986	3.3988	3.3990	3.3992	3.3993	3.3995
41 50	3.3997	3.3998	3.4000	3.4002	3.4004	3.4005	3.4007	3.4009	3.4011	3.4012
0 42 0	3.4014	3.4016	3.4017	3.4019	3.4021	3.4023	3.4024	3.4026	3.4028	3.4029
42 10	3.4031	3.4033	3.4035	3.4036	3.4038	3.4040	3.4041	3.4043	3.4045	3.4047
42 20	3.4048	3.4050	3.4052	3.4053	3.4055	3.4057	3.4059	3.4060	3.4062	3.4064
42 30	3.4065	3.4067	3.4069	3.4071	3.4073	3.4074	3.4076	3.4077	3.4079	3.4081
42 40	3.4082	3.4084	3.4086	3.4087	3.4089	3.4091	3.4093	3.4094	3.4096	3.4098
42 50	3.4099	3.4101	3.4103	3.4104	3.4106	3.4108	3.4109	3.4111	3.4113	3.4115
0 43 0	3.4116	3.4118	3.4120	3.4121	3.4123	3.4125	3.4126	3.4128	3.4130	3.4131
43 10	3.4133	3.4135	3.4136	3.4138	3.4140	3.4141	3.4143	3.4145	3.4146	3.4148
43 20	3.4150	3.4151	3.4153	3.4155	3.4156	3.4158	3.4160	3.4161	3.4163	3.4165
43 30	3.4166	3.4168	3.4170	3.4171	3.4173	3.4175	3.4176	3.4178	3.4180	3.4181
43 40	3.4183	3.4185	3.4186	3.4188	3.4190	3.4191	3.4193	3.4195	3.4196	3.4198
43 50	3.4200	3.4201	3.4203	3.4205	3.4206	3.4208	3.4209	3.4211	3.4213	3.4214
0 44 0	3.4216	3.4218	3.4219	3.4221	3.4223	3.4224	3.4226	3.4228	3.4229	3.4231
44 10	3.4232	3.4234	3.4236	3.4237	3.4239	3.4241	3.4242	3.4244	3.4246	3.4247
44 20	3.4249	3.4250	3.4252	3.4254	3.4255	3.4257	3.4259	3.4260	3.4262	3.4263
44 30	3.4265	3.4267	3.4268	3.4270	3.4272	3.4273	3.4275	3.4276	3.4278	3.4280
44 40	3.4281	3.4283	3.4285	3.4286	3.4288	3.4289	3.4291	3.4293	3.4294	3.4296
44 50	3.4298	3.4299	3.4301	3.4302	3.4304	3.4306	3.4307	3.4309	3.4310	3.4312
0 45 0	3.4314	3.4315	3.4317	3.4318	3.4320	3.4322	3.4323	3.4325	3.4326	3.4328
45 10	3.4330	3.4331	3.4333	3.4334	3.4336	3.4338	3.4339	3.4341	3.4342	3.4344
45 20	3.4346	3.4347	3.4349	3.4350	3.4352	3.4354	3.4355	3.4357	3.4358	3.4360
45 30	3.4362	3.4363	3.4365	3.4366	3.4368	3.4370	3.4371	3.4373	3.4374	3.4376
45 40	3.4378	3.4379	3.4381	3.4382	3.4384	3.4385	3.4387	3.4389	3.4390	3.4392
45 50	3.4393	3.4395	3.4396	3.4398	3.4400	3.4401	3.4403	3.4404	3.4406	3.4408
0 46 0	3.4409	3.4411	3.4412	3.4414	3.4415	3.4417	3.4419	3.4420	3.4422	3.4423
46 10	3.4425	3.4426	3.4428	3.4429	3.4431	3.4433	3.4434	3.4436	3.4437	3.4439
46 20	3.4440	3.4442	3.4444	3.4445	3.4447	3.4448	3.4450	3.4451	3.4453	3.4454
46 30	3.4456	3.4458	3.4459	3.4461	3.4462	3.4464	3.4465	3.4467	3.4468	3.4470
46 40	3.4472	3.4473	3.4475	3.4476	3.4478	3.4479	3.4481	3.4482	3.4484	3.4486
46 50	3.4487	3.4489	3.4490	3.4492	3.4493	3.4495	3.4496	3.4498	3.4499	3.4501
0 47 0	3.4502	3.4504	3.4506	3.4507	3.4509	3.4510	3.4512	3.4513	3.4515	3.4516
47 10	3.4518	3.4519	3.4521	3.4523	3.4524	3.4526	3.4527	3.4529	3.4530	3.4532
47 20	3.4533	3.4535	3.4536	3.4538	3.4539	3.4541	3.4542	3.4544	3.4545	3.4547
47 30	3.4548	3.4550	3.4551	3.4553	3.4555	3.4556	3.4558	3.4559	3.4561	3.4562
47 40	3.4564	3.4565	3.4567	3.4568	3.4570	3.4571	3.4573	3.4574	3.4576	3.4577
47 50	3.4579	3.4580	3.4582	3.4583	3.4585	3.4586	3.4588	3.4589	3.4591	3.4592
0 48 0	3.4594	3.4595	3.4597	3.4598	3.4600	3.4601	3.4603	3.4604	3.4606	3.4607
48 10	3.4609	3.4610	3.4612	3.4613	3.4615	3.4616	3.4618	3.4619	3.4621	3.4622
48 20	3.4624	3.4625	3.4627	3.4628	3.4630	3.4631	3.4633	3.4634	3.4636	3.4637
48 30	3.4639	3.4640	3.4642	3.4643	3.4645	3.4646	3.4648	3.4649	3.4651	3.4652
48 40	3.4654	3.4655	3.4657	3.4658	3.4660	3.4661	3.4663	3.4664	3.4666	3.4667
48 50	3.4669	3.4670	3.4672	3.4673	3.4675	3.4676	3.4678	3.4679	3.4681	3.4682
0 49 0	3.4683	3.4685	3.4686	3.4688	3.4689	3.4691	3.4692	3.4694	3.4695	3.4697
49 10	3.4698	3.4700	3.4701	3.4703	3.4704	3.4706	3.4707	3.4709	3.4710	3.4711
49 20	3.4713	3.4714	3.4716	3.4717	3.4719	3.4720	3.4722	3.4723	3.4725	3.4726
49 30	3.4728	3.4729	3.4730	3.4732	3.4733	3.4735	3.4736	3.4738	3.4739	3.4741
49 40	3.4742	3.4744	3.4745	3.4747	3.4748	3.4749	3.4751	3.4752	3.4754	3.4755
49 50	3.4757	3.4758	3.4760	3.4761	3.4763	3.4764	3.4765	3.4767	3.4768	3.4770

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 50' 0"	3.4771	3.4773	3.4774	3.4776	3.4777	3.4778	3.4780	3.4781	3.4783	3.4784
50 10	3.4786	3.4787	3.4789	3.4790	3.4791	3.4793	3.4794	3.4796	3.4797	3.4799
50 20	3.4800	3.4802	3.4803	3.4804	3.4806	3.4807	3.4809	3.4810	3.4812	3.4813
50 30	3.4814	3.4816	3.4817	3.4819	3.4820	3.4822	3.4823	3.4824	3.4826	3.4827
50 40	3.4829	3.4830	3.4832	3.4833	3.4834	3.4836	3.4837	3.4839	3.4840	3.4842
50 50	3.4848	3.4844	3.4846	3.4847	3.4849	3.4850	3.4852	3.4853	3.4854	3.4856
0 51 0	3.4857	3.4859	3.4860	3.4861	3.4863	3.4864	3.4866	3.4867	3.4869	3.4870
51 10	3.4871	3.4873	3.4874	3.4876	3.4877	3.4878	3.4880	3.4881	3.4883	3.4884
51 20	3.4886	3.4887	3.4888	3.4890	3.4891	3.4893	3.4894	3.4895	3.4897	3.4898
51 30	3.4900	3.4901	3.4902	3.4904	3.4905	3.4907	3.4908	3.4909	3.4911	3.4912
51 40	3.4914	3.4915	3.4916	3.4918	3.4919	3.4921	3.4922	3.4923	3.4925	3.4926
51 50	3.4928	3.4929	3.4930	3.4932	3.4933	3.4935	3.4936	3.4937	3.4939	3.4940
0 52 0	3.4942	3.4943	3.4944	3.4946	3.4947	3.4949	3.4950	3.4951	3.4953	3.4954
52 10	3.4955	3.4957	3.4958	3.4960	3.4961	3.4962	3.4964	3.4965	3.4967	3.4968
52 20	3.4969	3.4971	3.4972	3.4973	3.4975	3.4976	3.4978	3.4979	3.4980	3.4982
52 30	3.4983	3.4984	3.4986	3.4987	3.4989	3.4990	3.4991	3.4993	3.4994	3.4995
52 40	3.4997	3.4998	3.5000	3.5001	3.5002	3.5004	3.5005	3.5006	3.5008	3.5009
52 50	3.5011	3.5012	3.5013	3.5015	3.5016	3.5017	3.5019	3.5020	3.5022	3.5023
0 53 0	3.5024	3.5026	3.5027	3.5028	3.5030	3.5031	3.5032	3.5034	3.5035	3.5037
53 10	3.5038	3.5039	3.5041	3.5042	3.5043	3.5045	3.5046	3.5047	3.5049	3.5050
53 20	3.5051	3.5053	3.5054	3.5056	3.5057	3.5058	3.5060	3.5061	3.5062	3.5064
53 30	3.5065	3.5066	3.5068	3.5069	3.5070	3.5072	3.5073	3.5075	3.5076	3.5077
53 40	3.5079	3.5080	3.5081	3.5083	3.5084	3.5085	3.5087	3.5088	3.5089	3.5091
53 50	3.5092	3.5093	3.5095	3.5096	3.5097	3.5099	3.5100	3.5101	3.5103	3.5104
0 54 0	3.5105	3.5107	3.5108	3.5109	3.5111	3.5112	3.5113	3.5115	3.5116	3.5117
54 10	3.5119	3.5120	3.5122	3.5123	3.5124	3.5126	3.5127	3.5128	3.5130	3.5131
54 20	3.5132	3.5134	3.5135	3.5136	3.5138	3.5139	3.5140	3.5141	3.5143	3.5144
54 30	3.5145	3.5147	3.5148	3.5149	3.5151	3.5152	3.5153	3.5155	3.5156	3.5157
54 40	3.5159	3.5160	3.5161	3.5163	3.5164	3.5165	3.5167	3.5168	3.5169	3.5171
54 50	3.5172	3.5173	3.5175	3.5176	3.5177	3.5179	3.5180	3.5181	3.5183	3.5184
0 55 0	3.5185	3.5186	3.5188	3.5189	3.5190	3.5192	3.5193	3.5194	3.5196	3.5197
55 10	3.5198	3.5200	3.5201	3.5202	3.5204	3.5205	3.5206	3.5207	3.5209	3.5210
55 20	3.5211	3.5213	3.5214	3.5215	3.5217	3.5218	3.5219	3.5221	3.5222	3.5223
55 30	3.5224	3.5226	3.5227	3.5228	3.5230	3.5231	3.5232	3.5234	3.5235	3.5236
55 40	3.5237	3.5239	3.5240	3.5241	3.5243	3.5244	3.5245	3.5247	3.5248	3.5249
55 50	3.5250	3.5252	3.5253	3.5254	3.5256	3.5257	3.5258	3.5260	3.5261	3.5262
0 56 0	3.5263	3.5265	3.5266	3.5267	3.5269	3.5270	3.5271	3.5272	3.5274	3.5275
56 10	3.5276	3.5278	3.5279	3.5280	3.5281	3.5283	3.5284	3.5285	3.5287	3.5288
56 20	3.5289	3.5290	3.5292	3.5293	3.5294	3.5296	3.5297	3.5298	3.5299	3.5301
56 30	3.5302	3.5303	3.5305	3.5306	3.5307	3.5308	3.5310	3.5311	3.5312	3.5314
56 40	3.5315	3.5316	3.5317	3.5319	3.5320	3.5321	3.5322	3.5324	3.5325	3.5326
56 50	3.5328	3.5329	3.5330	3.5331	3.5333	3.5334	3.5335	3.5336	3.5338	3.5339
0 57 0	3.5340	3.5342	3.5343	3.5344	3.5345	3.5347	3.5348	3.5349	3.5350	3.5352
57 10	3.5353	3.5354	3.5355	3.5357	3.5358	3.5359	3.5361	3.5362	3.5363	3.5364
57 20	3.5366	3.5367	3.5368	3.5369	3.5371	3.5372	3.5373	3.5374	3.5376	3.5377
57 30	3.5378	3.5379	3.5381	3.5382	3.5383	3.5384	3.5386	3.5387	3.5388	3.5390
57 40	3.5391	3.5392	3.5393	3.5395	3.5396	3.5397	3.5398	3.5400	3.5401	3.5402
57 50	3.5403	3.5405	3.5406	3.5407	3.5408	3.5410	3.5411	3.5412	3.5413	3.5415
0 58 0	3.5416	3.5417	3.5418	3.5420	3.5421	3.5422	3.5423	3.5425	3.5426	3.5427
58 10	3.5428	3.5429	3.5431	3.5432	3.5433	3.5434	3.5436	3.5437	3.5438	3.5439
58 20	3.5441	3.5442	3.5443	3.5444	3.5446	3.5447	3.5448	3.5449	3.5451	3.5452
58 30	3.5453	3.5454	3.5456	3.5457	3.5458	3.5459	3.5460	3.5462	3.5463	3.5464
58 40	3.5465	3.5467	3.5468	3.5469	3.5470	3.5472	3.5473	3.5474	3.5475	3.5477
58 50	3.5478	3.5479	3.5480	3.5481	3.5483	3.5484	3.5485	3.5486	3.5488	3.5489
0 59 0	3.5490	3.5491	3.5492	3.5494	3.5495	3.5496	3.5497	3.5499	3.5500	3.5501
59 10	3.5502	3.5504	3.5505	3.5506	3.5507	3.5508	3.5510	3.5511	3.5512	3.5513
59 20	3.5514	3.5516	3.5517	3.5518	3.5519	3.5521	3.5522	3.5523	3.5524	3.5525
59 30	3.5527	3.5528	3.5529	3.5530	3.5532	3.5533	3.5534	3.5535	3.5536	3.5538
59 40	3.5539	3.5540	3.5541	3.5542	3.5544	3.5545	3.5546	3.5547	3.5549	3.5550
59 50	3.5551	3.5552	3.5553	3.5555	3.5556	3.5557	3.5558	3.5559	3.5561	3.5562

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.											
Arc.	0	1	2	3	4	5	6	7	8	9	
0 0	3.5563	3.5564	3.5565	3.5567	3.5568	3.5569	3.5570	3.5571	3.5573	3.5574	
0 10	3.5575	3.5576	3.5577	3.5579	3.5580	3.5581	3.5582	3.5583	3.5585	3.5586	
0 20	3.5587	3.5588	3.5589	3.5591	3.5592	3.5593	3.5594	3.5595	3.5597	3.5598	
0 30	3.5599	3.5600	3.5601	3.5603	3.5604	3.5605	3.5606	3.5607	3.5609	3.5610	
0 40	3.5611	3.5612	3.5613	3.5615	3.5616	3.5617	3.5618	3.5619	3.5621	3.5622	
0 50	3.5623	3.5624	3.5625	3.5626	3.5628	3.5629	3.5630	3.5631	3.5632	3.5634	
1 0	3.5635	3.5636	3.5637	3.5638	3.5640	3.5641	3.5642	3.5643	3.5644	3.5645	
1 10	3.5647	3.5648	3.5649	3.5650	3.5651	3.5653	3.5654	3.5655	3.5656	3.5657	
1 20	3.5658	3.5660	3.5661	3.5662	3.5663	3.5664	3.5666	3.5667	3.5668	3.5669	
1 30	3.5670	3.5671	3.5673	3.5674	3.5675	3.5676	3.5677	3.5678	3.5680	3.5681	
1 40	3.5682	3.5683	3.5684	3.5686	3.5687	3.5688	3.5689	3.5690	3.5691	3.5693	
1 50	3.5694	3.5695	3.5696	3.5697	3.5698	3.5700	3.5701	3.5702	3.5703	3.5704	
2 0	3.5705	3.5707	3.5708	3.5709	3.5710	3.5711	3.5712	3.5714	3.5715	3.5716	
2 10	3.5717	3.5718	3.5719	3.5721	3.5722	3.5723	3.5724	3.5725	3.5726	3.5728	
2 20	3.5729	3.5730	3.5731	3.5732	3.5733	3.5735	3.5736	3.5737	3.5738	3.5739	
2 30	3.5740	3.5741	3.5742	3.5744	3.5745	3.5746	3.5747	3.5748	3.5750	3.5751	
2 40	3.5752	3.5753	3.5754	3.5755	3.5756	3.5758	3.5759	3.5760	3.5761	3.5762	
2 50	3.5763	3.5765	3.5766	3.5767	3.5768	3.5769	3.5770	3.5771	3.5773	3.5774	
3 0	3.5775	3.5776	3.5777	3.5778	3.5780	3.5781	3.5782	3.5783	3.5784	3.5785	
3 10	3.5786	3.5788	3.5789	3.5790	3.5791	3.5792	3.5793	3.5794	3.5796	3.5797	
3 20	3.5798	3.5799	3.5800	3.5801	3.5802	3.5804	3.5805	3.5806	3.5807	3.5808	
3 30	3.5809	3.5810	3.5812	3.5813	3.5814	3.5815	3.5816	3.5817	3.5818	3.5819	
3 40	3.5821	3.5822	3.5823	3.5824	3.5825	3.5826	3.5827	3.5829	3.5830	3.5831	
3 50	3.5832	3.5833	3.5834	3.5835	3.5837	3.5838	3.5839	3.5840	3.5841	3.5842	
4 0	3.5843	3.5844	3.5846	3.5847	3.5848	3.5849	3.5850	3.5851	3.5852	3.5853	
4 10	3.5855	3.5856	3.5857	3.5858	3.5859	3.5860	3.5861	3.5862	3.5864	3.5865	
4 20	3.5866	3.5867	3.5868	3.5869	3.5870	3.5871	3.5873	3.5874	3.5875	3.5876	
4 30	3.5877	3.5878	3.5879	3.5880	3.5882	3.5883	3.5884	3.5885	3.5886	3.5887	
4 40	3.5888	3.5889	3.5891	3.5892	3.5893	3.5894	3.5895	3.5896	3.5897	3.5898	
4 50	3.5899	3.5901	3.5902	3.5903	3.5904	3.5905	3.5906	3.5907	3.5908	3.5910	
5 0	3.5911	3.5912	3.5913	3.5914	3.5915	3.5916	3.5917	3.5918	3.5920	3.5921	
5 10	3.5922	3.5923	3.5924	3.5925	3.5926	3.5927	3.5928	3.5929	3.5931	3.5932	
5 20	3.5933	3.5934	3.5935	3.5936	3.5937	3.5938	3.5940	3.5941	3.5942	3.5943	
5 30	3.5944	3.5945	3.5946	3.5947	3.5948	3.5949	3.5951	3.5952	3.5953	3.5954	
5 40	3.5955	3.5956	3.5957	3.5958	3.5959	3.5960	3.5962	3.5963	3.5964	3.5965	
5 50	3.5966	3.5967	3.5968	3.5969	3.5970	3.5971	3.5973	3.5974	3.5975	3.5976	
6 0	3.5977	3.5978	3.5979	3.5980	3.5981	3.5982	3.5984	3.5985	3.5986	3.5987	
6 10	3.5988	3.5989	3.5990	3.5991	3.5992	3.5993	3.5994	3.5996	3.5997	3.5998	
6 20	3.5999	3.6000	3.6001	3.6002	3.6003	3.6004	3.6005	3.6006	3.6008	3.6009	
6 30	3.6010	3.6011	3.6012	3.6013	3.6014	3.6015	3.6016	3.6017	3.6018	3.6020	
6 40	3.6021	3.6022	3.6023	3.6024	3.6025	3.6026	3.6027	3.6028	3.6029	3.6030	
6 50	3.6031	3.6033	3.6034	3.6035	3.6036	3.6037	3.6038	3.6039	3.6040	3.6041	
7 0	3.6042	3.6043	3.6044	3.6046	3.6047	3.6048	3.6049	3.6050	3.6051	3.6052	
7 10	3.6053	3.6054	3.6055	3.6056	3.6057	3.6058	3.6060	3.6061	3.6062	3.6063	
7 20	3.6064	3.6065	3.6066	3.6067	3.6068	3.6069	3.6070	3.6071	3.6073	3.6073	
7 30	3.6075	3.6076	3.6077	3.6078	3.6079	3.6080	3.6081	3.6082	3.6083	3.6084	
7 40	3.6085	3.6086	3.6087	3.6088	3.6090	3.6091	3.6092	3.6093	3.6094	3.6095	
7 50	3.6096	3.6097	3.6098	3.6099	3.6100	3.6101	3.6102	3.6103	3.6104	3.6106	
8 0	3.6107	3.6108	3.6109	3.6110	3.6111	3.6112	3.6113	3.6114	3.6115	3.6116	
8 10	3.6117	3.6118	3.6119	3.6120	3.6121	3.6123	3.6124	3.6125	3.6126	3.6127	
8 20	3.6128	3.6129	3.6130	3.6131	3.6132	3.6133	3.6134	3.6135	3.6136	3.6137	
8 30	3.6138	3.6139	3.6141	3.6142	3.6143	3.6144	3.6145	3.6146	3.6147	3.6148	
8 40	3.6149	3.6150	3.6151	3.6152	3.6153	3.6154	3.6155	3.6156	3.6157	3.6158	
8 50	3.6160	3.6161	3.6162	3.6163	3.6164	3.6165	3.6166	3.6167	3.6168	3.6169	
9 0	3.6170	3.6171	3.6172	3.6173	3.6174	3.6175	3.6176	3.6177	3.6178	3.6179	
9 10	3.6180	3.6182	3.6183	3.6184	3.6185	3.6186	3.6187	3.6188	3.6189	3.6190	
9 20	3.6191	3.6192	3.6193	3.6194	3.6195	3.6196	3.6197	3.6198	3.6199	3.6200	
9 30	3.6201	3.6202	3.6203	3.6204	3.6206	3.6207	3.6208	3.6209	3.6210	3.6211	
9 40	3.6212	3.6213	3.6214	3.6215	3.6216	3.6217	3.6218	3.6219	3.6220	3.6221	
9 50	3.6222	3.6223	3.6224	3.6225	3.6226	3.6227	3.6228	3.6229	3.6230	3.6231	

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$1^{\circ} 10' 0''$	3.6232	3.6234	3.6235	3.6236	3.6237	3.6238	3.6239	3.6240	3.6241	3.6242
10 10	3.6243	3.6244	3.6245	3.6246	3.6247	3.6248	3.6249	3.6250	3.6251	3.6252
10 20	3.6253	3.6254	3.6255	3.6256	3.6257	3.6258	3.6259	3.6260	3.6261	3.6262
10 30	3.6263	3.6264	3.6265	3.6266	3.6268	3.6269	3.6270	3.6271	3.6272	3.6273
10 40	3.6274	3.6275	3.6276	3.6277	3.6278	3.6279	3.6280	3.6281	3.6282	3.6283
10 50	3.6284	3.6285	3.6286	3.6287	3.6288	3.6289	3.6290	3.6291	3.6292	3.6293
1 11 0	3.6294	3.6295	3.6296	3.6297	3.6298	3.6299	3.6300	3.6301	3.6302	3.6303
11 10	3.6304	3.6305	3.6306	3.6307	3.6308	3.6309	3.6310	3.6311	3.6312	3.6313
11 20	3.6314	3.6315	3.6316	3.6317	3.6318	3.6320	3.6321	3.6322	3.6323	3.6324
11 30	3.6325	3.6326	3.6327	3.6328	3.6329	3.6330	3.6331	3.6332	3.6333	3.6334
11 40	3.6335	3.6336	3.6337	3.6338	3.6339	3.6340	3.6341	3.6342	3.6343	3.6344
11 50	3.6345	3.6346	3.6347	3.6348	3.6349	3.6350	3.6351	3.6352	3.6353	3.6354
1 12 0	3.6355	3.6356	3.6357	3.6358	3.6359	3.6360	3.6361	3.6362	3.6363	3.6364
12 10	3.6365	3.6366	3.6367	3.6368	3.6369	3.6370	3.6371	3.6372	3.6373	3.6374
12 20	3.6375	3.6376	3.6377	3.6378	3.6379	3.6380	3.6381	3.6382	3.6383	3.6384
12 30	3.6385	3.6386	3.6387	3.6388	3.6389	3.6390	3.6391	3.6392	3.6393	3.6394
12 40	3.6395	3.6396	3.6397	3.6398	3.6399	3.6400	3.6401	3.6402	3.6403	3.6404
12 50	3.6405	3.6406	3.6407	3.6408	3.6409	3.6410	3.6411	3.6412	3.6413	3.6414
1 13 0	3.6415	3.6416	3.6417	3.6418	3.6419	3.6420	3.6421	3.6422	3.6423	3.6424
13 10	3.6425	3.6426	3.6427	3.6428	3.6429	3.6430	3.6431	3.6432	3.6433	3.6434
13 20	3.6435	3.6436	3.6437	3.6438	3.6439	3.6440	3.6441	3.6442	3.6443	3.6444
13 30	3.6445	3.6446	3.6447	3.6448	3.6449	3.6450	3.6451	3.6452	3.6453	3.6454
13 40	3.6455	3.6456	3.6457	3.6458	3.6459	3.6460	3.6461	3.6462	3.6463	3.6464
13 50	3.6465	3.6466	3.6467	3.6468	3.6469	3.6470	3.6471	3.6472	3.6473	3.6474
1 14 0	3.6475	3.6476	3.6477	3.6478	3.6479	3.6480	3.6481	3.6482	3.6483	3.6484
14 10	3.6485	3.6486	3.6487	3.6488	3.6489	3.6490	3.6491	3.6492	3.6493	3.6494
14 20	3.6495	3.6496	3.6497	3.6498	3.6499	3.6500	3.6501	3.6502	3.6503	3.6504
14 30	3.6505	3.6506	3.6507	3.6508	3.6509	3.6510	3.6511	3.6512	3.6513	3.6514
14 40	3.6515	3.6516	3.6517	3.6518	3.6519	3.6520	3.6521	3.6522	3.6523	3.6524
14 50	3.6525	3.6526	3.6527	3.6528	3.6529	3.6530	3.6531	3.6532	3.6533	3.6534
1 15 0	3.6535	3.6536	3.6537	3.6538	3.6539	3.6540	3.6541	3.6542	3.6543	3.6544
15 10	3.6545	3.6546	3.6547	3.6548	3.6549	3.6550	3.6551	3.6552	3.6553	3.6554
15 20	3.6555	3.6556	3.6557	3.6558	3.6559	3.6560	3.6561	3.6562	3.6563	3.6564
15 30	3.6565	3.6566	3.6567	3.6568	3.6569	3.6570	3.6571	3.6572	3.6573	3.6574
15 40	3.6575	3.6576	3.6577	3.6578	3.6579	3.6580	3.6581	3.6582	3.6583	3.6584
15 50	3.6585	3.6586	3.6587	3.6588	3.6589	3.6590	3.6591	3.6592	3.6593	3.6594
1 16 0	3.6595	3.6596	3.6597	3.6598	3.6599	3.6600	3.6601	3.6602	3.6603	3.6604
16 10	3.6605	3.6606	3.6607	3.6608	3.6609	3.6610	3.6611	3.6612	3.6613	3.6614
16 20	3.6615	3.6616	3.6617	3.6618	3.6619	3.6620	3.6621	3.6622	3.6623	3.6624
16 30	3.6625	3.6626	3.6627	3.6628	3.6629	3.6630	3.6631	3.6632	3.6633	3.6634
16 40	3.6635	3.6636	3.6637	3.6638	3.6639	3.6640	3.6641	3.6642	3.6643	3.6644
16 50	3.6645	3.6646	3.6647	3.6648	3.6649	3.6650	3.6651	3.6652	3.6653	3.6654
1 17 0	3.6655	3.6656	3.6657	3.6658	3.6659	3.6660	3.6661	3.6662	3.6663	3.6664
17 10	3.6665	3.6666	3.6667	3.6668	3.6669	3.6670	3.6671	3.6672	3.6673	3.6674
17 20	3.6675	3.6676	3.6677	3.6678	3.6679	3.6680	3.6681	3.6682	3.6683	3.6684
17 30	3.6685	3.6686	3.6687	3.6688	3.6689	3.6690	3.6691	3.6692	3.6693	3.6694
17 40	3.6695	3.6696	3.6697	3.6698	3.6699	3.6700	3.6701	3.6702	3.6703	3.6704
17 50	3.6705	3.6706	3.6707	3.6708	3.6709	3.6710	3.6711	3.6712	3.6713	3.6714
1 18 0	3.6715	3.6716	3.6717	3.6718	3.6719	3.6720	3.6721	3.6722	3.6723	3.6724
18 10	3.6725	3.6726	3.6727	3.6728	3.6729	3.6730	3.6731	3.6732	3.6733	3.6734
18 20	3.6735	3.6736	3.6737	3.6738	3.6739	3.6740	3.6741	3.6742	3.6743	3.6744
18 30	3.6745	3.6746	3.6747	3.6748	3.6749	3.6750	3.6751	3.6752	3.6753	3.6754
18 40	3.6755	3.6756	3.6757	3.6758	3.6759	3.6760	3.6761	3.6762	3.6763	3.6764
18 50	3.6765	3.6766	3.6767	3.6768	3.6769	3.6770	3.6771	3.6772	3.6773	3.6774
1 19 0	3.6775	3.6776	3.6777	3.6778	3.6779	3.6780	3.6781	3.6782	3.6783	3.6784
19 10	3.6785	3.6786	3.6787	3.6788	3.6789	3.6790	3.6791	3.6792	3.6793	3.6794
19 20	3.6795	3.6796	3.6797	3.6798	3.6799	3.6800	3.6801	3.6802	3.6803	3.6804
19 30	3.6805	3.6806	3.6807	3.6808	3.6809	3.6810	3.6811	3.6812	3.6813	3.6814
19 40	3.6815	3.6816	3.6817	3.6818	3.6819	3.6820	3.6821	3.6822	3.6823	3.6824
19 50	3.6825	3.6826	3.6827	3.6828	3.6829	3.6830	3.6831	3.6832	3.6833	3.6834

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 20m. 0	3.6812	3.6813	3.6814	3.6815	3.6816	3.6817	3.6818	3.6819	3.6820	3.6821
20 10	3.6821	3.6822	3.6823	3.6824	3.6825	3.6826	3.6827	3.6828	3.6829	3.6830
20 20	3.6830	3.6831	3.6832	3.6833	3.6834	3.6835	3.6836	3.6837	3.6838	3.6839
20 30	3.6839	3.6840	3.6841	3.6842	3.6843	3.6844	3.6845	3.6846	3.6847	3.6848
20 40	3.6848	3.6849	3.6850	3.6851	3.6852	3.6853	3.6854	3.6855	3.6856	3.6857
20 50	3.6857	3.6858	3.6859	3.6860	3.6861	3.6862	3.6863	3.6864	3.6865	3.6866
1 21 0	3.6866	3.6867	3.6868	3.6869	3.6870	3.6871	3.6872	3.6873	3.6874	3.6875
21 10	3.6875	3.6876	3.6877	3.6878	3.6879	3.6880	3.6881	3.6882	3.6883	3.6884
21 20	3.6884	3.6885	3.6886	3.6887	3.6888	3.6889	3.6890	3.6891	3.6892	3.6893
21 30	3.6893	3.6894	3.6895	3.6896	3.6897	3.6898	3.6899	3.6900	3.6901	3.6902
21 40	3.6902	3.6903	3.6904	3.6905	3.6906	3.6907	3.6908	3.6909	3.6910	3.6911
21 50	3.6911	3.6912	3.6913	3.6914	3.6915	3.6916	3.6917	3.6918	3.6919	3.6920
1 22 0	3.6920	3.6921	3.6922	3.6923	3.6924	3.6925	3.6926	3.6927	3.6928	3.6929
22 10	3.6929	3.6930	3.6931	3.6932	3.6933	3.6934	3.6935	3.6936	3.6937	3.6938
22 20	3.6938	3.6939	3.6940	3.6941	3.6942	3.6943	3.6944	3.6945	3.6946	3.6947
22 30	3.6947	3.6948	3.6949	3.6950	3.6951	3.6952	3.6953	3.6954	3.6955	3.6956
22 40	3.6956	3.6957	3.6958	3.6959	3.6960	3.6961	3.6962	3.6963	3.6964	3.6965
22 50	3.6965	3.6966	3.6967	3.6968	3.6969	3.6970	3.6971	3.6972	3.6973	3.6974
1 23 0	3.6974	3.6975	3.6976	3.6977	3.6978	3.6979	3.6980	3.6981	3.6982	3.6983
23 10	3.6983	3.6984	3.6985	3.6986	3.6987	3.6988	3.6989	3.6990	3.6991	3.6992
23 20	3.6992	3.6993	3.6994	3.6995	3.6996	3.6997	3.6998	3.6999	3.7000	3.7001
23 30	3.7001	3.7002	3.7003	3.7004	3.7005	3.7006	3.7007	3.7008	3.7009	3.7010
23 40	3.7010	3.7011	3.7012	3.7013	3.7014	3.7015	3.7016	3.7017	3.7018	3.7019
23 50	3.7019	3.7020	3.7021	3.7022	3.7023	3.7024	3.7025	3.7026	3.7027	3.7028
1 24 0	3.7028	3.7029	3.7030	3.7031	3.7032	3.7033	3.7034	3.7035	3.7036	3.7037
24 10	3.7037	3.7038	3.7039	3.7040	3.7041	3.7042	3.7043	3.7044	3.7045	3.7046
24 20	3.7046	3.7047	3.7048	3.7049	3.7050	3.7051	3.7052	3.7053	3.7054	3.7055
24 30	3.7055	3.7056	3.7057	3.7058	3.7059	3.7060	3.7061	3.7062	3.7063	3.7064
24 40	3.7064	3.7065	3.7066	3.7067	3.7068	3.7069	3.7070	3.7071	3.7072	3.7073
24 50	3.7073	3.7074	3.7075	3.7076	3.7077	3.7078	3.7079	3.7080	3.7081	3.7082
1 25 0	3.7082	3.7083	3.7084	3.7085	3.7086	3.7087	3.7088	3.7089	3.7090	3.7091
25 10	3.7091	3.7092	3.7093	3.7094	3.7095	3.7096	3.7097	3.7098	3.7099	3.7100
25 20	3.7100	3.7101	3.7102	3.7103	3.7104	3.7105	3.7106	3.7107	3.7108	3.7109
25 30	3.7109	3.7110	3.7111	3.7112	3.7113	3.7114	3.7115	3.7116	3.7117	3.7118
25 40	3.7118	3.7119	3.7120	3.7121	3.7122	3.7123	3.7124	3.7125	3.7126	3.7127
25 50	3.7127	3.7128	3.7129	3.7130	3.7131	3.7132	3.7133	3.7134	3.7135	3.7136
1 26 0	3.7136	3.7137	3.7138	3.7139	3.7140	3.7141	3.7142	3.7143	3.7144	3.7145
26 10	3.7145	3.7146	3.7147	3.7148	3.7149	3.7150	3.7151	3.7152	3.7153	3.7154
26 20	3.7154	3.7155	3.7156	3.7157	3.7158	3.7159	3.7160	3.7161	3.7162	3.7163
26 30	3.7163	3.7164	3.7165	3.7166	3.7167	3.7168	3.7169	3.7170	3.7171	3.7172
26 40	3.7172	3.7173	3.7174	3.7175	3.7176	3.7177	3.7178	3.7179	3.7180	3.7181
26 50	3.7181	3.7182	3.7183	3.7184	3.7185	3.7186	3.7187	3.7188	3.7189	3.7190
1 27 0	3.7190	3.7191	3.7192	3.7193	3.7194	3.7195	3.7196	3.7197	3.7198	3.7199
27 10	3.7199	3.7200	3.7201	3.7202	3.7203	3.7204	3.7205	3.7206	3.7207	3.7208
27 20	3.7208	3.7209	3.7210	3.7211	3.7212	3.7213	3.7214	3.7215	3.7216	3.7217
27 30	3.7217	3.7218	3.7219	3.7220	3.7221	3.7222	3.7223	3.7224	3.7225	3.7226
27 40	3.7226	3.7227	3.7228	3.7229	3.7230	3.7231	3.7232	3.7233	3.7234	3.7235
27 50	3.7235	3.7236	3.7237	3.7238	3.7239	3.7240	3.7241	3.7242	3.7243	3.7244
1 28 0	3.7244	3.7245	3.7246	3.7247	3.7248	3.7249	3.7250	3.7251	3.7252	3.7253
28 10	3.7253	3.7254	3.7255	3.7256	3.7257	3.7258	3.7259	3.7260	3.7261	3.7262
28 20	3.7262	3.7263	3.7264	3.7265	3.7266	3.7267	3.7268	3.7269	3.7270	3.7271
28 30	3.7271	3.7272	3.7273	3.7274	3.7275	3.7276	3.7277	3.7278	3.7279	3.7280
28 40	3.7280	3.7281	3.7282	3.7283	3.7284	3.7285	3.7286	3.7287	3.7288	3.7289
28 50	3.7289	3.7290	3.7291	3.7292	3.7293	3.7294	3.7295	3.7296	3.7297	3.7298
1 29 0	3.7298	3.7299	3.7300	3.7301	3.7302	3.7303	3.7304	3.7305	3.7306	3.7307
29 10	3.7307	3.7308	3.7309	3.7310	3.7311	3.7312	3.7313	3.7314	3.7315	3.7316
29 20	3.7316	3.7317	3.7318	3.7319	3.7320	3.7321	3.7322	3.7323	3.7324	3.7325
29 30	3.7325	3.7326	3.7327	3.7328	3.7329	3.7330	3.7331	3.7332	3.7333	3.7334
29 40	3.7334	3.7335	3.7336	3.7337	3.7338	3.7339	3.7340	3.7341	3.7342	3.7343
29 50	3.7343	3.7344	3.7345	3.7346	3.7347	3.7348	3.7349	3.7350	3.7351	3.7352

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1° 30' 0"	3.7324	3.7325	3.7326	3.7326	3.7327	3.7328	3.7329	3.7330	3.7330	3.7331
30 10	3.7332	3.7333	3.7334	3.7334	3.7335	3.7336	3.7337	3.7338	3.7338	3.7339
30 20	3.7340	3.7341	3.7342	3.7342	3.7343	3.7344	3.7345	3.7346	3.7346	3.7347
30 30	3.7348	3.7349	3.7350	3.7350	3.7351	3.7352	3.7353	3.7354	3.7354	3.7355
30 40	3.7356	3.7357	3.7358	3.7358	3.7359	3.7360	3.7361	3.7362	3.7362	3.7363
30 50	3.7364	3.7365	3.7366	3.7366	3.7367	3.7368	3.7369	3.7370	3.7370	3.7371
1 31 0	3.7372	3.7373	3.7374	3.7374	3.7375	3.7376	3.7377	3.7377	3.7378	3.7379
31 10	3.7380	3.7381	3.7381	3.7382	3.7383	3.7384	3.7385	3.7385	3.7386	3.7387
31 20	3.7388	3.7389	3.7389	3.7390	3.7391	3.7392	3.7393	3.7393	3.7394	3.7395
31 30	3.7396	3.7397	3.7397	3.7398	3.7399	3.7400	3.7400	3.7401	3.7402	3.7403
31 40	3.7404	3.7404	3.7405	3.7406	3.7407	3.7408	3.7408	3.7409	3.7410	3.7411
31 50	3.7412	3.7412	3.7413	3.7414	3.7415	3.7415	3.7416	3.7417	3.7418	3.7419
1 32 0	3.7419	3.7420	3.7421	3.7422	3.7423	3.7423	3.7424	3.7425	3.7426	3.7426
32 10	3.7427	3.7428	3.7429	3.7430	3.7430	3.7431	3.7432	3.7433	3.7434	3.7434
32 20	3.7435	3.7436	3.7437	3.7437	3.7438	3.7439	3.7440	3.7441	3.7441	3.7442
32 30	3.7443	3.7444	3.7444	3.7445	3.7446	3.7447	3.7448	3.7448	3.7449	3.7450
32 40	3.7451	3.7452	3.7452	3.7453	3.7454	3.7455	3.7455	3.7456	3.7457	3.7458
32 50	3.7459	3.7459	3.7460	3.7461	3.7462	3.7462	3.7463	3.7464	3.7465	3.7466
1 33 0	3.7466	3.7467	3.7468	3.7469	3.7469	3.7470	3.7471	3.7472	3.7473	3.7473
33 10	3.7474	3.7475	3.7476	3.7476	3.7477	3.7478	3.7479	3.7480	3.7480	3.7481
33 20	3.7482	3.7483	3.7483	3.7484	3.7485	3.7486	3.7487	3.7487	3.7488	3.7489
33 30	3.7490	3.7490	3.7491	3.7492	3.7493	3.7493	3.7494	3.7495	3.7496	3.7497
33 40	3.7497	3.7498	3.7499	3.7500	3.7500	3.7501	3.7502	3.7503	3.7504	3.7504
33 50	3.7505	3.7506	3.7507	3.7507	3.7508	3.7509	3.7510	3.7510	3.7511	3.7512
1 34 0	3.7513	3.7514	3.7514	3.7515	3.7516	3.7517	3.7517	3.7518	3.7519	3.7520
34 10	3.7520	3.7521	3.7522	3.7523	3.7524	3.7524	3.7525	3.7526	3.7527	3.7527
34 20	3.7528	3.7529	3.7530	3.7530	3.7531	3.7532	3.7533	3.7534	3.7534	3.7535
34 30	3.7536	3.7537	3.7537	3.7538	3.7539	3.7540	3.7540	3.7541	3.7542	3.7543
34 40	3.7543	3.7544	3.7545	3.7546	3.7547	3.7547	3.7548	3.7549	3.7550	3.7550
34 50	3.7551	3.7552	3.7553	3.7553	3.7554	3.7555	3.7556	3.7556	3.7557	3.7558
1 35 0	3.7559	3.7560	3.7560	3.7561	3.7562	3.7563	3.7563	3.7564	3.7565	3.7566
35 10	3.7566	3.7567	3.7568	3.7568	3.7569	3.7570	3.7571	3.7572	3.7572	3.7573
35 20	3.7574	3.7575	3.7575	3.7576	3.7577	3.7578	3.7579	3.7579	3.7580	3.7581
35 30	3.7582	3.7582	3.7583	3.7584	3.7585	3.7585	3.7586	3.7587	3.7588	3.7588
35 40	3.7589	3.7590	3.7591	3.7591	3.7592	3.7593	3.7594	3.7594	3.7595	3.7596
35 50	3.7597	3.7597	3.7598	3.7599	3.7600	3.7600	3.7601	3.7602	3.7603	3.7603
1 36 0	3.7604	3.7605	3.7606	3.7606	3.7607	3.7608	3.7609	3.7609	3.7610	3.7611
36 10	3.7612	3.7613	3.7613	3.7614	3.7615	3.7616	3.7616	3.7617	3.7618	3.7619
36 20	3.7619	3.7620	3.7621	3.7622	3.7622	3.7623	3.7624	3.7625	3.7625	3.7626
36 30	3.7627	3.7628	3.7628	3.7629	3.7630	3.7631	3.7631	3.7632	3.7633	3.7634
36 40	3.7634	3.7635	3.7636	3.7637	3.7637	3.7638	3.7639	3.7640	3.7640	3.7641
36 50	3.7642	3.7643	3.7643	3.7644	3.7645	3.7645	3.7646	3.7647	3.7648	3.7648
1 37 0	3.7649	3.7650	3.7651	3.7651	3.7652	3.7653	3.7654	3.7654	3.7655	3.7656
37 10	3.7657	3.7657	3.7658	3.7659	3.7660	3.7660	3.7661	3.7662	3.7663	3.7663
37 20	3.7664	3.7665	3.7666	3.7666	3.7667	3.7668	3.7669	3.7669	3.7670	3.7671
37 30	3.7672	3.7672	3.7673	3.7674	3.7675	3.7675	3.7676	3.7677	3.7677	3.7678
37 40	3.7679	3.7680	3.7681	3.7681	3.7682	3.7683	3.7683	3.7684	3.7685	3.7686
37 50	3.7686	3.7687	3.7688	3.7689	3.7689	3.7690	3.7691	3.7692	3.7692	3.7693
1 38 0	3.7694	3.7695	3.7696	3.7696	3.7697	3.7697	3.7698	3.7699	3.7700	3.7700
38 10	3.7701	3.7702	3.7703	3.7703	3.7704	3.7705	3.7706	3.7706	3.7707	3.7708
38 20	3.7709	3.7709	3.7710	3.7711	3.7711	3.7712	3.7713	3.7714	3.7714	3.7715
38 30	3.7716	3.7717	3.7717	3.7718	3.7719	3.7720	3.7720	3.7721	3.7722	3.7722
38 40	3.7723	3.7724	3.7725	3.7725	3.7726	3.7727	3.7728	3.7728	3.7729	3.7730
38 50	3.7731	3.7731	3.7732	3.7733	3.7733	3.7734	3.7735	3.7736	3.7736	3.7737
1 39 0	3.7738	3.7739	3.7739	3.7740	3.7741	3.7742	3.7742	3.7743	3.7744	3.7744
39 10	3.7745	3.7746	3.7747	3.7747	3.7748	3.7749	3.7750	3.7750	3.7751	3.7752
39 20	3.7752	3.7753	3.7754	3.7755	3.7755	3.7756	3.7757	3.7758	3.7758	3.7759
39 30	3.7760	3.7760	3.7761	3.7762	3.7763	3.7763	3.7764	3.7765	3.7766	3.7766
39 40	3.7767	3.7768	3.7768	3.7769	3.7770	3.7771	3.7771	3.7772	3.7773	3.7774
39 50	3.7774	3.7775	3.7776	3.7776	3.7777	3.7778	3.7779	3.7779	3.7780	3.7781

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 ^h 40 ^m 0 ^s	3.7782	3.7782	3.7783	3.7784	3.7784	3.7785	3.7786	3.7787	3.7787	3.7788
40 10	3.7789	3.7789	3.7790	3.7791	3.7792	3.7792	3.7793	3.7794	3.7795	3.7795
40 20	3.7796	3.7797	3.7797	3.7798	3.7799	3.7800	3.7800	3.7801	3.7802	3.7802
40 30	3.7803	3.7804	3.7805	3.7805	3.7806	3.7807	3.7807	3.7808	3.7809	3.7810
40 40	3.7810	3.7811	3.7812	3.7813	3.7813	3.7814	3.7815	3.7815	3.7816	3.7817
40 50	3.7818	3.7818	3.7819	3.7820	3.7820	3.7821	3.7822	3.7823	3.7823	3.7824
1 41 0	3.7825	3.7825	3.7826	3.7827	3.7828	3.7828	3.7829	3.7830	3.7830	3.7831
41 10	3.7832	3.7833	3.7833	3.7834	3.7835	3.7835	3.7836	3.7837	3.7838	3.7838
41 20	3.7839	3.7840	3.7840	3.7841	3.7842	3.7843	3.7843	3.7844	3.7845	3.7845
41 30	3.7846	3.7847	3.7848	3.7848	3.7849	3.7850	3.7850	3.7851	3.7852	3.7853
41 40	3.7853	3.7854	3.7855	3.7855	3.7856	3.7857	3.7858	3.7858	3.7859	3.7860
41 50	3.7860	3.7861	3.7862	3.7863	3.7863	3.7864	3.7865	3.7865	3.7866	3.7867
1 42 0	3.7868	3.7868	3.7869	3.7870	3.7870	3.7871	3.7872	3.7872	3.7873	3.7874
42 10	3.7875	3.7875	3.7876	3.7877	3.7877	3.7878	3.7879	3.7880	3.7880	3.7881
42 20	3.7882	3.7882	3.7883	3.7884	3.7885	3.7885	3.7886	3.7887	3.7887	3.7888
42 30	3.7889	3.7889	3.7890	3.7891	3.7892	3.7892	3.7893	3.7894	3.7894	3.7895
42 40	3.7896	3.7897	3.7897	3.7898	3.7899	3.7899	3.7900	3.7901	3.7901	3.7902
42 50	3.7903	3.7904	3.7904	3.7905	3.7906	3.7906	3.7907	3.7908	3.7908	3.7909
1 43 0	3.7910	3.7911	3.7911	3.7912	3.7913	3.7913	3.7914	3.7915	3.7916	3.7916
43 10	3.7917	3.7918	3.7918	3.7919	3.7920	3.7920	3.7921	3.7922	3.7923	3.7923
43 20	3.7924	3.7925	3.7925	3.7926	3.7927	3.7927	3.7928	3.7929	3.7930	3.7930
43 30	3.7931	3.7932	3.7932	3.7933	3.7934	3.7934	3.7935	3.7936	3.7937	3.7937
43 40	3.7938	3.7939	3.7939	3.7940	3.7941	3.7941	3.7942	3.7943	3.7943	3.7944
43 50	3.7945	3.7946	3.7946	3.7947	3.7948	3.7948	3.7949	3.7950	3.7950	3.7951
1 44 0	3.7952	3.7953	3.7953	3.7954	3.7955	3.7955	3.7956	3.7957	3.7957	3.7958
44 10	3.7959	3.7959	3.7960	3.7961	3.7962	3.7962	3.7963	3.7964	3.7964	3.7965
44 20	3.7966	3.7966	3.7967	3.7968	3.7969	3.7969	3.7970	3.7971	3.7971	3.7972
44 30	3.7973	3.7973	3.7974	3.7975	3.7975	3.7976	3.7977	3.7978	3.7978	3.7979
44 40	3.7980	3.7980	3.7981	3.7982	3.7982	3.7983	3.7984	3.7984	3.7985	3.7986
44 50	3.7987	3.7987	3.7988	3.7989	3.7989	3.7990	3.7991	3.7991	3.7992	3.7993
1 45 0	3.7993	3.7994	3.7995	3.7995	3.7996	3.7997	3.7998	3.7998	3.7999	3.8000
45 10	3.8000	3.8001	3.8002	3.8002	3.8003	3.8004	3.8004	3.8005	3.8006	3.8006
45 20	3.8007	3.8008	3.8009	3.8009	3.8010	3.8011	3.8011	3.8012	3.8013	3.8013
45 30	3.8014	3.8015	3.8015	3.8016	3.8017	3.8017	3.8018	3.8019	3.8020	3.8020
45 40	3.8021	3.8022	3.8022	3.8023	3.8024	3.8024	3.8025	3.8026	3.8026	3.8027
45 50	3.8028	3.8028	3.8029	3.8030	3.8030	3.8031	3.8032	3.8033	3.8033	3.8034
1 46 0	3.8035	3.8035	3.8036	3.8036	3.8037	3.8038	3.8039	3.8039	3.8040	3.8041
46 10	3.8041	3.8042	3.8043	3.8043	3.8044	3.8045	3.8045	3.8046	3.8047	3.8048
46 20	3.8048	3.8049	3.8050	3.8050	3.8051	3.8052	3.8052	3.8053	3.8054	3.8054
46 30	3.8055	3.8056	3.8056	3.8057	3.8058	3.8058	3.8059	3.8060	3.8060	3.8061
46 40	3.8062	3.8062	3.8063	3.8064	3.8065	3.8065	3.8066	3.8067	3.8067	3.8068
46 50	3.8069	3.8069	3.8070	3.8071	3.8071	3.8072	3.8073	3.8073	3.8074	3.8075
1 47 0	3.8075	3.8076	3.8077	3.8077	3.8078	3.8079	3.8079	3.8080	3.8081	3.8081
47 10	3.8082	3.8083	3.8083	3.8084	3.8085	3.8085	3.8086	3.8087	3.8088	3.8088
47 20	3.8089	3.8090	3.8090	3.8091	3.8092	3.8092	3.8093	3.8094	3.8094	3.8095
47 30	3.8096	3.8096	3.8097	3.8098	3.8098	3.8099	3.8099	3.8100	3.8101	3.8102
47 40	3.8102	3.8103	3.8104	3.8104	3.8105	3.8106	3.8106	3.8107	3.8108	3.8108
47 50	3.8109	3.8110	3.8110	3.8111	3.8112	3.8112	3.8113	3.8114	3.8114	3.8115
1 48 0	3.8116	3.8116	3.8117	3.8118	3.8118	3.8119	3.8120	3.8120	3.8121	3.8122
48 10	3.8122	3.8123	3.8124	3.8124	3.8125	3.8126	3.8126	3.8127	3.8128	3.8128
48 20	3.8129	3.8130	3.8130	3.8131	3.8132	3.8132	3.8133	3.8134	3.8134	3.8135
48 30	3.8136	3.8136	3.8137	3.8138	3.8138	3.8139	3.8140	3.8140	3.8141	3.8142
48 40	3.8142	3.8143	3.8144	3.8144	3.8145	3.8146	3.8146	3.8147	3.8148	3.8148
48 50	3.8149	3.8150	3.8150	3.8151	3.8152	3.8152	3.8153	3.8154	3.8154	3.8155
1 49 0	3.8156	3.8156	3.8157	3.8158	3.8158	3.8159	3.8160	3.8160	3.8161	3.8162
49 10	3.8162	3.8163	3.8164	3.8164	3.8165	3.8166	3.8166	3.8167	3.8168	3.8168
49 20	3.8169	3.8170	3.8170	3.8171	3.8172	3.8172	3.8173	3.8174	3.8174	3.8175
49 30	3.8176	3.8176	3.8177	3.8178	3.8178	3.8179	3.8180	3.8180	3.8181	3.8182
49 40	3.8182	3.8183	3.8184	3.8184	3.8185	3.8185	3.8186	3.8187	3.8188	3.8188
49 50	3.8189	3.8190	3.8190	3.8191	3.8191	3.8192	3.8193	3.8193	3.8194	3.8195

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 50 0	3.8195	3.8196	3.8197	3.8197	3.8198	3.8199	3.8199	3.8200	3.8201	3.8201
50 10	3.8202	3.8203	3.8203	3.8204	3.8205	3.8205	3.8206	3.8207	3.8207	3.8208
50 20	3.8209	3.8209	3.8210	3.8211	3.8211	3.8212	3.8213	3.8213	3.8214	3.8214
50 30	3.8215	3.8216	3.8216	3.8217	3.8218	3.8218	3.8219	3.8220	3.8220	3.8221
50 40	3.8222	3.8222	3.8223	3.8224	3.8224	3.8225	3.8226	3.8226	3.8227	3.8228
50 50	3.8228	3.8229	3.8230	3.8230	3.8231	3.8231	3.8232	3.8233	3.8233	3.8234
1 51 0	3.8235	3.8235	3.8236	3.8237	3.8237	3.8238	3.8239	3.8239	3.8240	3.8241
51 10	3.8241	3.8242	3.8243	3.8243	3.8244	3.8245	3.8245	3.8246	3.8246	3.8247
51 20	3.8248	3.8248	3.8249	3.8250	3.8250	3.8251	3.8252	3.8252	3.8253	3.8254
51 30	3.8254	3.8255	3.8256	3.8256	3.8257	3.8258	3.8258	3.8259	3.8259	3.8260
51 40	3.8261	3.8261	3.8262	3.8263	3.8263	3.8264	3.8265	3.8265	3.8266	3.8267
51 50	3.8267	3.8268	3.8269	3.8269	3.8270	3.8270	3.8271	3.8272	3.8272	3.8273
1 52 0	3.8274	3.8274	3.8275	3.8276	3.8276	3.8277	3.8278	3.8278	3.8279	3.8280
52 10	3.8280	3.8281	3.8281	3.8282	3.8283	3.8283	3.8284	3.8285	3.8285	3.8286
52 20	3.8287	3.8287	3.8288	3.8289	3.8289	3.8290	3.8290	3.8291	3.8292	3.8292
52 30	3.8293	3.8294	3.8294	3.8295	3.8296	3.8296	3.8297	3.8298	3.8298	3.8299
52 40	3.8299	3.8300	3.8301	3.8301	3.8302	3.8303	3.8303	3.8304	3.8305	3.8305
52 50	3.8306	3.8307	3.8307	3.8308	3.8308	3.8309	3.8310	3.8310	3.8311	3.8312
1 53 0	3.8312	3.8313	3.8314	3.8314	3.8315	3.8315	3.8316	3.8317	3.8317	3.8318
53 10	3.8319	3.8319	3.8320	3.8321	3.8321	3.8322	3.8323	3.8323	3.8324	3.8324
53 20	3.8325	3.8326	3.8326	3.8327	3.8328	3.8328	3.8329	3.8330	3.8330	3.8331
53 30	3.8331	3.8332	3.8333	3.8333	3.8334	3.8335	3.8335	3.8336	3.8337	3.8337
53 40	3.8338	3.8338	3.8339	3.8340	3.8340	3.8341	3.8342	3.8342	3.8343	3.8344
53 50	3.8344	3.8345	3.8345	3.8346	3.8347	3.8347	3.8348	3.8349	3.8349	3.8350
1 54 0	3.8351	3.8351	3.8352	3.8352	3.8353	3.8354	3.8354	3.8355	3.8356	3.8356
54 10	3.8357	3.8358	3.8358	3.8359	3.8359	3.8360	3.8361	3.8361	3.8362	3.8363
54 20	3.8363	3.8364	3.8365	3.8365	3.8366	3.8366	3.8367	3.8368	3.8368	3.8369
54 30	3.8370	3.8370	3.8371	3.8371	3.8372	3.8373	3.8373	3.8374	3.8375	3.8375
54 40	3.8376	3.8377	3.8377	3.8378	3.8378	3.8379	3.8380	3.8380	3.8381	3.8382
54 50	3.8382	3.8383	3.8383	3.8384	3.8385	3.8385	3.8386	3.8387	3.8387	3.8388
1 55 0	3.8388	3.8389	3.8390	3.8390	3.8391	3.8392	3.8392	3.8393	3.8394	3.8394
55 10	3.8395	3.8395	3.8396	3.8397	3.8397	3.8398	3.8399	3.8399	3.8400	3.8400
55 20	3.8401	3.8402	3.8402	3.8403	3.8404	3.8404	3.8405	3.8405	3.8406	3.8407
55 30	3.8407	3.8408	3.8409	3.8409	3.8410	3.8410	3.8411	3.8412	3.8412	3.8413
55 40	3.8414	3.8414	3.8415	3.8415	3.8416	3.8417	3.8417	3.8418	3.8419	3.8419
55 50	3.8420	3.8420	3.8421	3.8422	3.8422	3.8423	3.8424	3.8424	3.8425	3.8425
1 56 0	3.8426	3.8427	3.8427	3.8428	3.8429	3.8429	3.8430	3.8430	3.8431	3.8432
56 10	3.8432	3.8433	3.8434	3.8434	3.8435	3.8435	3.8436	3.8437	3.8437	3.8438
56 20	3.8439	3.8439	3.8440	3.8440	3.8441	3.8442	3.8442	3.8443	3.8444	3.8444
56 30	3.8445	3.8445	3.8446	3.8447	3.8447	3.8448	3.8448	3.8449	3.8450	3.8450
56 40	3.8451	3.8452	3.8452	3.8453	3.8453	3.8454	3.8455	3.8455	3.8456	3.8457
56 50	3.8457	3.8458	3.8458	3.8459	3.8460	3.8460	3.8461	3.8462	3.8462	3.8463
1 57 0	3.8463	3.8464	3.8465	3.8465	3.8466	3.8466	3.8467	3.8468	3.8468	3.8469
57 10	3.8470	3.8470	3.8471	3.8471	3.8472	3.8473	3.8473	3.8474	3.8474	3.8475
57 20	3.8476	3.8476	3.8477	3.8478	3.8478	3.8479	3.8479	3.8480	3.8481	3.8481
57 30	3.8482	3.8483	3.8483	3.8484	3.8484	3.8485	3.8486	3.8486	3.8487	3.8487
57 40	3.8488	3.8489	3.8489	3.8490	3.8491	3.8491	3.8492	3.8492	3.8493	3.8494
57 50	3.8494	3.8495	3.8495	3.8496	3.8497	3.8497	3.8498	3.8499	3.8499	3.8500
1 58 0	3.8500	3.8501	3.8502	3.8502	3.8503	3.8503	3.8504	3.8505	3.8505	3.8506
58 10	3.8506	3.8507	3.8508	3.8508	3.8509	3.8510	3.8510	3.8511	3.8511	3.8512
58 20	3.8513	3.8513	3.8514	3.8514	3.8515	3.8516	3.8516	3.8517	3.8517	3.8518
58 30	3.8519	3.8519	3.8520	3.8521	3.8521	3.8522	3.8522	3.8523	3.8524	3.8524
58 40	3.8525	3.8525	3.8526	3.8527	3.8527	3.8528	3.8528	3.8529	3.8530	3.8530
58 50	3.8531	3.8532	3.8532	3.8533	3.8533	3.8534	3.8535	3.8535	3.8536	3.8536
1 59 0	3.8537	3.8538	3.8538	3.8539	3.8539	3.8540	3.8541	3.8541	3.8542	3.8542
59 10	3.8543	3.8544	3.8544	3.8545	3.8545	3.8546	3.8547	3.8547	3.8548	3.8549
59 20	3.8549	3.8550	3.8550	3.8551	3.8552	3.8552	3.8553	3.8553	3.8554	3.8555
59 30	3.8555	3.8556	3.8556	3.8557	3.8558	3.8558	3.8559	3.8559	3.8560	3.8561
59 40	3.8561	3.8562	3.8562	3.8563	3.8564	3.8564	3.8565	3.8565	3.8566	3.8567
59 50	3.8567	3.8568	3.8568	3.8569	3.8570	3.8570	3.8571	3.8572	3.8572	3.8573

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.											
Arc.	0	1	2	3	4	5	6	7	8	9	
0° 0' 0"	3.8578	3.8574	3.8575	3.8575	3.8576	3.8576	3.8577	3.8578	3.8578	3.8579	
0 10	3.8579	3.8580	3.8581	3.8581	3.8582	3.8582	3.8583	3.8584	3.8584	3.8585	
0 20	3.8585	3.8586	3.8587	3.8587	3.8588	3.8588	3.8589	3.8590	3.8590	3.8591	
0 30	3.8591	3.8592	3.8593	3.8593	3.8594	3.8594	3.8595	3.8596	3.8596	3.8597	
0 40	3.8597	3.8598	3.8599	3.8599	3.8600	3.8600	3.8601	3.8602	3.8602	3.8603	
0 50	3.8603	3.8604	3.8605	3.8605	3.8606	3.8606	3.8607	3.8608	3.8608	3.8609	
1 0	3.8609	3.8610	3.8611	3.8611	3.8612	3.8612	3.8613	3.8614	3.8614	3.8615	
1 10	3.8615	3.8616	3.8617	3.8617	3.8618	3.8618	3.8619	3.8620	3.8620	3.8621	
1 20	3.8621	3.8622	3.8623	3.8623	3.8624	3.8624	3.8625	3.8625	3.8626	3.8627	
1 30	3.8627	3.8628	3.8628	3.8629	3.8630	3.8630	3.8631	3.8631	3.8632	3.8633	
1 40	3.8633	3.8634	3.8634	3.8635	3.8636	3.8636	3.8637	3.8637	3.8638	3.8639	
1 50	3.8639	3.8640	3.8640	3.8641	3.8642	3.8642	3.8643	3.8643	3.8644	3.8645	
2 0	3.8645	3.8646	3.8646	3.8647	3.8647	3.8648	3.8648	3.8649	3.8649	3.8650	
2 10	3.8651	3.8652	3.8652	3.8653	3.8653	3.8654	3.8655	3.8655	3.8656	3.8656	
2 20	3.8657	3.8658	3.8658	3.8659	3.8659	3.8660	3.8661	3.8661	3.8662	3.8662	
2 30	3.8663	3.8663	3.8664	3.8665	3.8665	3.8666	3.8666	3.8667	3.8668	3.8668	
2 40	3.8669	3.8669	3.8670	3.8671	3.8671	3.8672	3.8672	3.8673	3.8673	3.8674	
2 50	3.8675	3.8675	3.8676	3.8676	3.8677	3.8678	3.8678	3.8679	3.8679	3.8680	
3 0	3.8681	3.8681	3.8682	3.8682	3.8683	3.8684	3.8684	3.8685	3.8685	3.8686	
3 10	3.8686	3.8687	3.8688	3.8688	3.8689	3.8689	3.8690	3.8691	3.8691	3.8692	
3 20	3.8692	3.8693	3.8693	3.8694	3.8695	3.8695	3.8696	3.8696	3.8697	3.8698	
3 30	3.8698	3.8699	3.8699	3.8700	3.8701	3.8701	3.8702	3.8702	3.8703	3.8703	
3 40	3.8704	3.8705	3.8705	3.8706	3.8706	3.8707	3.8707	3.8708	3.8709	3.8709	
3 50	3.8710	3.8710	3.8711	3.8712	3.8712	3.8713	3.8713	3.8714	3.8715	3.8715	
4 0	3.8716	3.8716	3.8717	3.8717	3.8718	3.8719	3.8719	3.8720	3.8720	3.8721	
4 10	3.8722	3.8722	3.8723	3.8723	3.8724	3.8724	3.8725	3.8726	3.8726	3.8727	
4 20	3.8727	3.8728	3.8729	3.8729	3.8730	3.8730	3.8731	3.8731	3.8732	3.8733	
4 30	3.8733	3.8734	3.8734	3.8735	3.8736	3.8736	3.8737	3.8737	3.8738	3.8738	
4 40	3.8739	3.8740	3.8740	3.8741	3.8741	3.8742	3.8742	3.8743	3.8744	3.8744	
4 50	3.8745	3.8745	3.8746	3.8747	3.8747	3.8748	3.8748	3.8749	3.8749	3.8750	
5 0	3.8751	3.8751	3.8752	3.8752	3.8753	3.8754	3.8754	3.8755	3.8755	3.8756	
5 10	3.8756	3.8757	3.8758	3.8758	3.8759	3.8759	3.8760	3.8760	3.8761	3.8762	
5 20	3.8762	3.8763	3.8763	3.8764	3.8764	3.8765	3.8766	3.8766	3.8767	3.8767	
5 30	3.8768	3.8769	3.8769	3.8770	3.8770	3.8771	3.8771	3.8772	3.8773	3.8773	
5 40	3.8774	3.8774	3.8775	3.8775	3.8776	3.8777	3.8777	3.8778	3.8778	3.8779	
5 50	3.8779	3.8780	3.8781	3.8781	3.8782	3.8782	3.8783	3.8783	3.8784	3.8785	
6 0	3.8785	3.8786	3.8786	3.8787	3.8788	3.8788	3.8789	3.8789	3.8790	3.8790	
6 10	3.8791	3.8792	3.8792	3.8793	3.8793	3.8794	3.8794	3.8795	3.8796	3.8796	
6 20	3.8797	3.8797	3.8798	3.8798	3.8799	3.8800	3.8800	3.8801	3.8801	3.8802	
6 30	3.8802	3.8803	3.8804	3.8804	3.8805	3.8805	3.8806	3.8806	3.8807	3.8808	
6 40	3.8808	3.8809	3.8809	3.8810	3.8810	3.8811	3.8811	3.8812	3.8813	3.8813	
6 50	3.8814	3.8814	3.8815	3.8816	3.8816	3.8817	3.8817	3.8818	3.8818	3.8819	
7 0	3.8820	3.8820	3.8821	3.8821	3.8822	3.8822	3.8823	3.8824	3.8824	3.8825	
7 10	3.8825	3.8826	3.8826	3.8827	3.8828	3.8828	3.8829	3.8829	3.8830	3.8830	
7 20	3.8831	3.8832	3.8832	3.8833	3.8833	3.8834	3.8834	3.8835	3.8835	3.8836	
7 30	3.8837	3.8837	3.8838	3.8838	3.8839	3.8839	3.8840	3.8841	3.8841	3.8842	
7 40	3.8842	3.8843	3.8843	3.8844	3.8844	3.8845	3.8846	3.8846	3.8847	3.8847	
7 50	3.8848	3.8849	3.8849	3.8850	3.8850	3.8851	3.8851	3.8852	3.8852	3.8853	
8 0	3.8854	3.8854	3.8855	3.8855	3.8856	3.8856	3.8857	3.8858	3.8858	3.8859	
8 10	3.8859	3.8860	3.8860	3.8861	3.8862	3.8862	3.8863	3.8863	3.8864	3.8864	
8 20	3.8865	3.8865	3.8866	3.8867	3.8867	3.8868	3.8868	3.8869	3.8869	3.8870	
8 30	3.8871	3.8871	3.8872	3.8872	3.8873	3.8873	3.8874	3.8874	3.8875	3.8876	
8 40	3.8876	3.8877	3.8877	3.8878	3.8878	3.8879	3.8880	3.8880	3.8881	3.8881	
8 50	3.8882	3.8882	3.8883	3.8883	3.8884	3.8885	3.8885	3.8886	3.8886	3.8887	
9 0	3.8887	3.8888	3.8889	3.8889	3.8890	3.8890	3.8891	3.8891	3.8892	3.8892	
9 10	3.8893	3.8894	3.8894	3.8895	3.8895	3.8896	3.8896	3.8897	3.8897	3.8898	
9 20	3.8899	3.8899	3.8900	3.8900	3.8901	3.8901	3.8902	3.8903	3.8903	3.8904	
9 30	3.8904	3.8905	3.8905	3.8906	3.8906	3.8907	3.8908	3.8908	3.8909	3.8909	
9 40	3.8910	3.8910	3.8911	3.8911	3.8912	3.8912	3.8913	3.8914	3.8914	3.8915	
9 50	3.8915	3.8916	3.8916	3.8917	3.8918	3.8918	3.8919	3.8919	3.8920	3.8920	

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$2^{\circ} 10' 0''$	3.8921	3.8922	3.8923	3.8923	3.8923	3.8924	3.8924	3.8925	3.8925	3.8926
10 10	3.8927	3.8927	3.8928	3.8928	3.8929	3.8929	3.8930	3.8930	3.8931	3.8932
10 20	3.8932	3.8933	3.8933	3.8934	3.8934	3.8935	3.8935	3.8936	3.8937	3.8937
10 30	3.8938	3.8938	3.8939	3.8939	3.8940	3.8940	3.8941	3.8941	3.8942	3.8943
10 40	3.8943	3.8944	3.8944	3.8945	3.8945	3.8946	3.8946	3.8947	3.8948	3.8948
10 50	3.8949	3.8949	3.8950	3.8950	3.8951	3.8951	3.8952	3.8953	3.8953	3.8954
2 11 0	3.8954	3.8955	3.8955	3.8956	3.8956	3.8957	3.8958	3.8958	3.8959	3.8959
11 10	3.8960	3.8960	3.8961	3.8961	3.8962	3.8963	3.8963	3.8964	3.8964	3.8965
11 20	3.8965	3.8966	3.8966	3.8967	3.8967	3.8968	3.8969	3.8969	3.8970	3.8970
11 30	3.8971	3.8971	3.8972	3.8972	3.8973	3.8974	3.8974	3.8975	3.8975	3.8976
11 40	3.8976	3.8977	3.8977	3.8978	3.8978	3.8979	3.8980	3.8980	3.8981	3.8981
11 50	3.8982	3.8982	3.8983	3.8983	3.8984	3.8985	3.8985	3.8986	3.8986	3.8987
2 12 0	3.8987	3.8988	3.8988	3.8989	3.8989	3.8990	3.8991	3.8991	3.8992	3.8992
12 10	3.8993	3.8993	3.8994	3.8994	3.8995	3.8996	3.8996	3.8997	3.8997	3.8998
12 20	3.8998	3.8999	3.8999	3.9000	3.9000	3.9001	3.9001	3.9002	3.9003	3.9003
12 30	3.9004	3.9004	3.9005	3.9005	3.9006	3.9006	3.9007	3.9007	3.9008	3.9009
12 40	3.9009	3.9010	3.9010	3.9011	3.9011	3.9012	3.9012	3.9013	3.9013	3.9014
12 50	3.9015	3.9015	3.9016	3.9016	3.9017	3.9017	3.9018	3.9018	3.9019	3.9019
2 13 0	3.9020	3.9021	3.9021	3.9022	3.9022	3.9023	3.9023	3.9024	3.9024	3.9025
13 10	3.9025	3.9026	3.9027	3.9027	3.9028	3.9028	3.9029	3.9029	3.9030	3.9030
13 20	3.9031	3.9031	3.9032	3.9033	3.9033	3.9034	3.9034	3.9035	3.9035	3.9036
13 30	3.9036	3.9037	3.9037	3.9038	3.9038	3.9039	3.9040	3.9040	3.9041	3.9041
13 40	3.9042	3.9042	3.9043	3.9043	3.9044	3.9044	3.9045	3.9046	3.9046	3.9047
13 50	3.9047	3.9048	3.9048	3.9049	3.9049	3.9050	3.9050	3.9051	3.9051	3.9052
2 14 0	3.9053	3.9053	3.9054	3.9054	3.9055	3.9055	3.9056	3.9056	3.9057	3.9057
14 10	3.9058	3.9058	3.9059	3.9060	3.9060	3.9061	3.9061	3.9062	3.9062	3.9063
14 20	3.9063	3.9064	3.9064	3.9065	3.9066	3.9066	3.9067	3.9067	3.9068	3.9068
14 30	3.9069	3.9069	3.9070	3.9070	3.9071	3.9071	3.9072	3.9073	3.9073	3.9074
14 40	3.9074	3.9075	3.9075	3.9076	3.9076	3.9077	3.9077	3.9078	3.9078	3.9079
14 50	3.9079	3.9080	3.9081	3.9081	3.9082	3.9082	3.9083	3.9083	3.9084	3.9084
2 15 0	3.9085	3.9085	3.9086	3.9086	3.9087	3.9088	3.9088	3.9089	3.9089	3.9090
15 10	3.9090	3.9091	3.9091	3.9092	3.9092	3.9093	3.9093	3.9094	3.9094	3.9095
15 20	3.9096	3.9096	3.9097	3.9097	3.9098	3.9098	3.9099	3.9099	3.9100	3.9100
15 30	3.9101	3.9101	3.9102	3.9103	3.9103	3.9104	3.9104	3.9105	3.9105	3.9106
15 40	3.9106	3.9107	3.9107	3.9108	3.9108	3.9109	3.9109	3.9110	3.9111	3.9111
15 50	3.9112	3.9112	3.9113	3.9113	3.9114	3.9114	3.9115	3.9115	3.9116	3.9116
2 16 0	3.9117	3.9117	3.9118	3.9118	3.9119	3.9120	3.9120	3.9121	3.9121	3.9122
16 10	3.9122	3.9123	3.9123	3.9124	3.9124	3.9125	3.9125	3.9126	3.9126	3.9127
16 20	3.9128	3.9128	3.9129	3.9129	3.9130	3.9130	3.9131	3.9131	3.9132	3.9132
16 30	3.9133	3.9133	3.9134	3.9134	3.9135	3.9135	3.9136	3.9137	3.9137	3.9138
16 40	3.9138	3.9139	3.9139	3.9140	3.9140	3.9141	3.9141	3.9142	3.9142	3.9143
16 50	3.9143	3.9144	3.9144	3.9145	3.9145	3.9146	3.9147	3.9147	3.9148	3.9148
2 17 0	3.9149	3.9149	3.9150	3.9150	3.9151	3.9151	3.9152	3.9152	3.9153	3.9153
17 10	3.9154	3.9155	3.9155	3.9156	3.9156	3.9157	3.9157	3.9158	3.9158	3.9159
17 20	3.9159	3.9160	3.9160	3.9161	3.9161	3.9162	3.9162	3.9163	3.9163	3.9164
17 30	3.9165	3.9165	3.9166	3.9166	3.9167	3.9167	3.9168	3.9168	3.9169	3.9169
17 40	3.9170	3.9170	3.9171	3.9171	3.9172	3.9172	3.9173	3.9173	3.9174	3.9175
17 50	3.9175	3.9176	3.9176	3.9177	3.9177	3.9178	3.9178	3.9179	3.9179	3.9180
2 18 0	3.9180	3.9181	3.9181	3.9182	3.9182	3.9183	3.9183	3.9184	3.9184	3.9185
18 10	3.9186	3.9186	3.9187	3.9187	3.9188	3.9188	3.9189	3.9189	3.9190	3.9190
18 20	3.9191	3.9191	3.9192	3.9192	3.9193	3.9193	3.9194	3.9194	3.9195	3.9195
18 30	3.9196	3.9197	3.9197	3.9198	3.9198	3.9199	3.9199	3.9200	3.9200	3.9201
18 40	3.9201	3.9202	3.9202	3.9203	3.9203	3.9204	3.9204	3.9205	3.9205	3.9206
18 50	3.9206	3.9207	3.9207	3.9208	3.9209	3.9209	3.9210	3.9210	3.9211	3.9211
2 19 0	3.9212	3.9212	3.9213	3.9213	3.9214	3.9214	3.9215	3.9215	3.9216	3.9216
19 10	3.9217	3.9217	3.9218	3.9218	3.9219	3.9219	3.9220	3.9221	3.9221	3.9222
19 20	3.9222	3.9223	3.9223	3.9224	3.9224	3.9225	3.9225	3.9226	3.9226	3.9227
19 30	3.9227	3.9228	3.9228	3.9229	3.9229	3.9230	3.9230	3.9231	3.9231	3.9232
19 40	3.9232	3.9233	3.9233	3.9234	3.9235	3.9235	3.9236	3.9236	3.9237	3.9237
19 50	3.9238	3.9238	3.9239	3.9239	3.9240	3.9240	3.9241	3.9241	3.9242	3.9242

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
20 0	3.9243	3.9243	3.9244	3.9244	3.9245	3.9245	3.9246	3.9246	3.9247	3.9247
20 10	3.9248	3.9248	3.9249	3.9250	3.9250	3.9251	3.9251	3.9252	3.9252	3.9253
20 20	3.9253	3.9254	3.9254	3.9255	3.9255	3.9256	3.9256	3.9257	3.9257	3.9258
20 30	3.9258	3.9259	3.9259	3.9260	3.9260	3.9261	3.9261	3.9262	3.9262	3.9263
20 40	3.9263	3.9264	3.9264	3.9265	3.9265	3.9266	3.9267	3.9267	3.9268	3.9268
20 50	3.9269	3.9269	3.9270	3.9270	3.9271	3.9271	3.9272	3.9272	3.9273	3.9273
2 21 0	3.9274	3.9274	3.9275	3.9275	3.9276	3.9276	3.9277	3.9277	3.9278	3.9278
21 10	3.9279	3.9279	3.9280	3.9280	3.9281	3.9281	3.9282	3.9282	3.9283	3.9283
21 20	3.9284	3.9284	3.9285	3.9285	3.9286	3.9287	3.9287	3.9288	3.9288	3.9289
21 30	3.9289	3.9290	3.9290	3.9291	3.9291	3.9292	3.9292	3.9293	3.9293	3.9294
21 40	3.9294	3.9295	3.9295	3.9296	3.9296	3.9297	3.9297	3.9298	3.9298	3.9299
21 50	3.9299	3.9300	3.9300	3.9301	3.9301	3.9302	3.9302	3.9303	3.9303	3.9304
2 22 0	3.9304	3.9305	3.9305	3.9306	3.9306	3.9307	3.9307	3.9308	3.9308	3.9309
22 10	3.9309	3.9310	3.9311	3.9311	3.9312	3.9312	3.9313	3.9313	3.9314	3.9314
22 20	3.9315	3.9315	3.9316	3.9316	3.9317	3.9317	3.9318	3.9318	3.9319	3.9319
22 30	3.9320	3.9320	3.9321	3.9321	3.9322	3.9322	3.9323	3.9323	3.9324	3.9324
22 40	3.9325	3.9325	3.9326	3.9326	3.9327	3.9327	3.9328	3.9328	3.9329	3.9329
22 50	3.9330	3.9330	3.9331	3.9331	3.9332	3.9332	3.9333	3.9333	3.9334	3.9334
2 23 0	3.9335	3.9335	3.9336	3.9336	3.9337	3.9337	3.9338	3.9338	3.9339	3.9339
23 10	3.9340	3.9340	3.9341	3.9341	3.9342	3.9342	3.9343	3.9343	3.9344	3.9344
23 20	3.9345	3.9345	3.9346	3.9346	3.9347	3.9348	3.9348	3.9349	3.9349	3.9350
23 30	3.9350	3.9351	3.9351	3.9352	3.9352	3.9353	3.9353	3.9354	3.9354	3.9355
23 40	3.9355	3.9356	3.9356	3.9357	3.9357	3.9358	3.9358	3.9359	3.9359	3.9360
23 50	3.9360	3.9361	3.9361	3.9362	3.9362	3.9363	3.9363	3.9364	3.9364	3.9365
2 24 0	3.9365	3.9366	3.9366	3.9367	3.9367	3.9368	3.9368	3.9369	3.9369	3.9370
24 10	3.9370	3.9371	3.9371	3.9372	3.9372	3.9373	3.9373	3.9374	3.9374	3.9375
24 20	3.9375	3.9376	3.9376	3.9377	3.9377	3.9378	3.9378	3.9379	3.9379	3.9380
24 30	3.9380	3.9381	3.9381	3.9382	3.9382	3.9383	3.9383	3.9384	3.9384	3.9385
24 40	3.9385	3.9386	3.9386	3.9387	3.9387	3.9388	3.9388	3.9389	3.9389	3.9390
24 50	3.9390	3.9391	3.9391	3.9392	3.9392	3.9393	3.9393	3.9394	3.9394	3.9395
2 25 0	3.9395	3.9396	3.9396	3.9397	3.9397	3.9398	3.9398	3.9399	3.9399	3.9400
25 10	3.9400	3.9401	3.9401	3.9402	3.9402	3.9403	3.9403	3.9404	3.9404	3.9405
25 20	3.9405	3.9406	3.9406	3.9407	3.9407	3.9408	3.9408	3.9409	3.9409	3.9410
25 30	3.9410	3.9411	3.9411	3.9412	3.9412	3.9413	3.9413	3.9414	3.9414	3.9415
25 40	3.9415	3.9416	3.9416	3.9417	3.9417	3.9418	3.9418	3.9419	3.9419	3.9420
25 50	3.9420	3.9421	3.9421	3.9422	3.9422	3.9423	3.9423	3.9424	3.9424	3.9425
2 26 0	3.9425	3.9426	3.9426	3.9427	3.9427	3.9428	3.9428	3.9429	3.9429	3.9430
26 10	3.9430	3.9430	3.9431	3.9431	3.9432	3.9432	3.9433	3.9433	3.9434	3.9434
26 20	3.9435	3.9435	3.9436	3.9436	3.9437	3.9437	3.9438	3.9438	3.9439	3.9439
26 30	3.9440	3.9440	3.9441	3.9441	3.9442	3.9442	3.9443	3.9443	3.9444	3.9444
26 40	3.9445	3.9445	3.9446	3.9446	3.9447	3.9447	3.9448	3.9448	3.9449	3.9449
26 50	3.9450	3.9450	3.9451	3.9451	3.9452	3.9452	3.9453	3.9453	3.9454	3.9454
2 27 0	3.9455	3.9455	3.9456	3.9456	3.9457	3.9457	3.9458	3.9458	3.9459	3.9459
27 10	3.9460	3.9460	3.9461	3.9461	3.9462	3.9462	3.9463	3.9463	3.9464	3.9464
27 20	3.9465	3.9465	3.9466	3.9466	3.9466	3.9467	3.9467	3.9468	3.9468	3.9469
27 30	3.9469	3.9470	3.9470	3.9471	3.9471	3.9472	3.9472	3.9473	3.9473	3.9474
27 40	3.9474	3.9475	3.9475	3.9476	3.9476	3.9477	3.9477	3.9478	3.9478	3.9479
27 50	3.9479	3.9480	3.9480	3.9481	3.9481	3.9482	3.9482	3.9483	3.9483	3.9484
2 28 0	3.9484	3.9485	3.9485	3.9486	3.9486	3.9487	3.9487	3.9488	3.9488	3.9489
28 10	3.9489	3.9490	3.9490	3.9490	3.9491	3.9491	3.9492	3.9492	3.9493	3.9493
28 20	3.9494	3.9494	3.9495	3.9495	3.9496	3.9496	3.9497	3.9497	3.9498	3.9498
28 30	3.9499	3.9499	3.9500	3.9500	3.9501	3.9501	3.9502	3.9502	3.9503	3.9503
28 40	3.9504	3.9504	3.9505	3.9505	3.9506	3.9506	3.9507	3.9507	3.9508	3.9508
28 50	3.9509	3.9509	3.9509	3.9510	3.9510	3.9511	3.9511	3.9512	3.9512	3.9513
2 29 0	3.9513	3.9514	3.9514	3.9515	3.9515	3.9516	3.9516	3.9517	3.9517	3.9518
29 10	3.9518	3.9519	3.9519	3.9520	3.9520	3.9521	3.9521	3.9522	3.9522	3.9523
29 20	3.9523	3.9524	3.9524	3.9525	3.9525	3.9526	3.9526	3.9526	3.9527	3.9527
29 30	3.9528	3.9528	3.9529	3.9529	3.9530	3.9530	3.9531	3.9531	3.9532	3.9532
29 40	3.9533	3.9533	3.9534	3.9534	3.9535	3.9535	3.9536	3.9536	3.9537	3.9537
29 50	3.9538	3.9538	3.9539	3.9539	3.9540	3.9540	3.9541	3.9541	3.9542	3.9542

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$2^{\circ} 30' 0''$	3.9542	3.9543	3.9543	3.9544	3.9544	3.9545	3.9545	3.9546	3.9546	3.9547
30 10	3.9547	3.9548	3.9548	3.9549	3.9549	3.9550	3.9550	3.9551	3.9551	3.9552
30 20	3.9552	3.9553	3.9553	3.9554	3.9554	3.9554	3.9555	3.9555	3.9556	3.9556
30 30	3.9557	3.9557	3.9558	3.9558	3.9559	3.9559	3.9560	3.9560	3.9561	3.9561
30 40	3.9562	3.9562	3.9563	3.9563	3.9564	3.9564	3.9565	3.9565	3.9566	3.9566
30 50	3.9566	3.9567	3.9567	3.9568	3.9568	3.9569	3.9569	3.9570	3.9570	3.9571
2 31 0	3.9571	3.9572	3.9572	3.9573	3.9573	3.9574	3.9574	3.9575	3.9575	3.9576
31 10	3.9576	3.9577	3.9577	3.9578	3.9578	3.9578	3.9579	3.9579	3.9580	3.9580
31 20	3.9581	3.9581	3.9582	3.9582	3.9583	3.9583	3.9584	3.9584	3.9585	3.9585
31 30	3.9586	3.9586	3.9587	3.9587	3.9588	3.9588	3.9589	3.9589	3.9589	3.9590
31 40	3.9590	3.9591	3.9591	3.9592	3.9592	3.9593	3.9593	3.9594	3.9594	3.9595
31 50	3.9595	3.9596	3.9596	3.9597	3.9597	3.9598	3.9598	3.9599	3.9599	3.9599
2 32 0	3.9600	3.9600	3.9601	3.9601	3.9602	3.9602	3.9603	3.9603	3.9604	3.9604
32 10	3.9605	3.9605	3.9606	3.9606	3.9607	3.9607	3.9608	3.9608	3.9609	3.9609
32 20	3.9609	3.9610	3.9610	3.9611	3.9611	3.9612	3.9612	3.9613	3.9613	3.9614
32 30	3.9614	3.9615	3.9615	3.9616	3.9616	3.9617	3.9617	3.9618	3.9618	3.9618
32 40	3.9619	3.9619	3.9620	3.9620	3.9621	3.9621	3.9622	3.9622	3.9623	3.9623
32 50	3.9624	3.9624	3.9625	3.9625	3.9626	3.9626	3.9627	3.9627	3.9627	3.9628
2 33 0	3.9628	3.9629	3.9629	3.9630	3.9630	3.9631	3.9631	3.9632	3.9632	3.9633
33 10	3.9633	3.9634	3.9634	3.9634	3.9635	3.9635	3.9636	3.9636	3.9637	3.9637
33 20	3.9638	3.9638	3.9639	3.9639	3.9640	3.9640	3.9641	3.9641	3.9642	3.9642
33 30	3.9642	3.9643	3.9643	3.9644	3.9644	3.9645	3.9645	3.9646	3.9646	3.9647
33 40	3.9647	3.9648	3.9648	3.9649	3.9649	3.9650	3.9650	3.9651	3.9651	3.9652
33 50	3.9652	3.9653	3.9653	3.9653	3.9654	3.9654	3.9655	3.9655	3.9656	3.9656
2 34 0	3.9657	3.9657	3.9658	3.9658	3.9658	3.9659	3.9659	3.9660	3.9660	3.9661
34 10	3.9661	3.9662	3.9662	3.9663	3.9663	3.9664	3.9664	3.9665	3.9665	3.9665
34 20	3.9666	3.9666	3.9667	3.9667	3.9668	3.9668	3.9669	3.9669	3.9670	3.9670
34 30	3.9671	3.9671	3.9672	3.9672	3.9672	3.9673	3.9673	3.9674	3.9674	3.9675
34 40	3.9675	3.9676	3.9676	3.9677	3.9677	3.9678	3.9678	3.9679	3.9679	3.9680
34 50	3.9680	3.9681	3.9681	3.9682	3.9682	3.9682	3.9683	3.9683	3.9684	3.9684
2 35 0	3.9685	3.9685	3.9686	3.9686	3.9687	3.9687	3.9688	3.9688	3.9689	3.9689
35 10	3.9689	3.9690	3.9690	3.9691	3.9691	3.9692	3.9692	3.9693	3.9693	3.9694
35 20	3.9694	3.9695	3.9695	3.9696	3.9696	3.9696	3.9697	3.9697	3.9698	3.9698
35 30	3.9699	3.9699	3.9700	3.9700	3.9701	3.9701	3.9702	3.9702	3.9703	3.9703
35 40	3.9703	3.9704	3.9704	3.9705	3.9705	3.9706	3.9706	3.9707	3.9707	3.9708
35 50	3.9708	3.9709	3.9709	3.9710	3.9710	3.9710	3.9711	3.9711	3.9712	3.9712
2 36 0	3.9713	3.9713	3.9714	3.9714	3.9715	3.9715	3.9716	3.9716	3.9716	3.9717
36 10	3.9717	3.9718	3.9718	3.9719	3.9719	3.9720	3.9720	3.9721	3.9721	3.9722
36 20	3.9722	3.9722	3.9723	3.9723	3.9724	3.9724	3.9725	3.9725	3.9726	3.9726
36 30	3.9727	3.9727	3.9728	3.9728	3.9729	3.9729	3.9729	3.9730	3.9730	3.9731
36 40	3.9731	3.9732	3.9732	3.9733	3.9733	3.9734	3.9734	3.9735	3.9735	3.9735
36 50	3.9736	3.9736	3.9737	3.9737	3.9738	3.9738	3.9739	3.9739	3.9740	3.9740
2 37 0	3.9741	3.9741	3.9741	3.9742	3.9742	3.9743	3.9743	3.9744	3.9744	3.9745
37 10	3.9745	3.9746	3.9746	3.9746	3.9747	3.9747	3.9748	3.9748	3.9749	3.9749
37 20	3.9750	3.9750	3.9751	3.9751	3.9752	3.9752	3.9752	3.9753	3.9753	3.9754
37 30	3.9754	3.9755	3.9755	3.9756	3.9756	3.9757	3.9757	3.9758	3.9758	3.9758
37 40	3.9759	3.9759	3.9760	3.9760	3.9761	3.9761	3.9762	3.9762	3.9763	3.9763
37 50	3.9768	3.9764	3.9764	3.9765	3.9765	3.9766	3.9766	3.9767	3.9767	3.9768
2 38 0	3.9768	3.9769	3.9769	3.9769	3.9770	3.9770	3.9771	3.9771	3.9772	3.9772
38 10	3.9773	3.9773	3.9774	3.9774	3.9775	3.9775	3.9775	3.9776	3.9776	3.9777
38 20	3.9777	3.9778	3.9778	3.9779	3.9779	3.9779	3.9780	3.9780	3.9781	3.9781
38 30	3.9782	3.9782	3.9783	3.9783	3.9784	3.9784	3.9785	3.9785	3.9785	3.9786
38 40	3.9786	3.9787	3.9787	3.9788	3.9788	3.9789	3.9789	3.9790	3.9790	3.9790
38 50	3.9791	3.9791	3.9792	3.9792	3.9793	3.9793	3.9794	3.9794	3.9795	3.9795
2 39 0	3.9795	3.9796	3.9796	3.9797	3.9797	3.9798	3.9798	3.9799	3.9799	3.9800
39 10	3.9800	3.9800	3.9801	3.9801	3.9802	3.9802	3.9803	3.9803	3.9804	3.9804
39 20	3.9805	3.9805	3.9805	3.9806	3.9806	3.9807	3.9807	3.9808	3.9808	3.9809
39 30	3.9809	3.9810	3.9810	3.9810	3.9811	3.9811	3.9812	3.9812	3.9813	3.9813
39 40	3.9814	3.9814	3.9815	3.9815	3.9815	3.9816	3.9816	3.9817	3.9817	3.9818
39 50	3.9818	3.9819	3.9819	3.9819	3.9820	3.9820	3.9821	3.9821	3.9822	3.9822

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
2 40 0	3.9823	3.9823	3.9824	3.9824	3.9825	3.9825	3.9825	3.9826	3.9826	3.9827
40 10	3.9827	3.9828	3.9828	3.9829	3.9829	3.9829	3.9830	3.9830	3.9831	3.9831
40 20	3.9832	3.9832	3.9833	3.9833	3.9834	3.9834	3.9834	3.9835	3.9835	3.9836
40 30	3.9836	3.9837	3.9837	3.9838	3.9838	3.9839	3.9839	3.9839	3.9840	3.9840
40 40	3.9841	3.9841	3.9842	3.9842	3.9843	3.9843	3.9843	3.9844	3.9844	3.9845
40 50	3.9845	3.9846	3.9846	3.9847	3.9847	3.9848	3.9848	3.9848	3.9849	3.9849
2 41 0	3.9850	3.9850	3.9851	3.9851	3.9852	3.9852	3.9852	3.9853	3.9853	3.9854
41 10	3.9854	3.9855	3.9855	3.9856	3.9856	3.9857	3.9857	3.9857	3.9858	3.9858
41 20	3.9859	3.9859	3.9860	3.9860	3.9861	3.9861	3.9861	3.9862	3.9862	3.9863
41 30	3.9863	3.9864	3.9864	3.9865	3.9865	3.9866	3.9866	3.9866	3.9867	3.9867
41 40	3.9868	3.9868	3.9869	3.9869	3.9870	3.9870	3.9870	3.9871	3.9871	3.9872
41 50	3.9872	3.9873	3.9873	3.9874	3.9874	3.9874	3.9875	3.9875	3.9876	3.9876
2 42 0	3.9877	3.9877	3.9878	3.9878	3.9878	3.9879	3.9879	3.9880	3.9880	3.9881
42 10	3.9881	3.9882	3.9882	3.9882	3.9883	3.9883	3.9884	3.9884	3.9885	3.9885
42 20	3.9886	3.9886	3.9886	3.9887	3.9887	3.9888	3.9888	3.9889	3.9889	3.9890
42 30	3.9890	3.9890	3.9891	3.9891	3.9892	3.9892	3.9893	3.9893	3.9894	3.9894
42 40	3.9894	3.9895	3.9895	3.9896	3.9896	3.9897	3.9897	3.9898	3.9898	3.9899
42 50	3.9899	3.9899	3.9900	3.9900	3.9901	3.9901	3.9902	3.9902	3.9903	3.9903
2 43 0	3.9903	3.9904	3.9904	3.9905	3.9905	3.9906	3.9906	3.9906	3.9907	3.9907
43 10	3.9908	3.9908	3.9909	3.9909	3.9910	3.9910	3.9911	3.9911	3.9912	3.9912
43 20	3.9912	3.9913	3.9913	3.9914	3.9914	3.9914	3.9915	3.9915	3.9916	3.9916
43 30	3.9917	3.9917	3.9918	3.9918	3.9918	3.9919	3.9919	3.9920	3.9920	3.9921
43 40	3.9921	3.9922	3.9922	3.9922	3.9923	3.9923	3.9924	3.9924	3.9925	3.9925
43 50	3.9926	3.9926	3.9926	3.9927	3.9927	3.9928	3.9928	3.9929	3.9929	3.9930
2 44 0	3.9930	3.9930	3.9931	3.9931	3.9932	3.9932	3.9933	3.9933	3.9933	3.9934
44 10	3.9934	3.9935	3.9935	3.9936	3.9936	3.9937	3.9937	3.9937	3.9938	3.9938
44 20	3.9939	3.9939	3.9940	3.9940	3.9941	3.9941	3.9941	3.9942	3.9942	3.9943
44 30	3.9943	3.9944	3.9944	3.9944	3.9945	3.9945	3.9946	3.9946	3.9947	3.9947
44 40	3.9948	3.9948	3.9948	3.9949	3.9949	3.9950	3.9950	3.9951	3.9951	3.9952
44 50	3.9952	3.9952	3.9953	3.9953	3.9954	3.9954	3.9955	3.9955	3.9955	3.9956
2 45 0	3.9956	3.9957	3.9957	3.9958	3.9958	3.9959	3.9959	3.9959	3.9960	3.9960
45 10	3.9961	3.9961	3.9962	3.9962	3.9963	3.9963	3.9964	3.9964	3.9965	3.9965
45 20	3.9965	3.9966	3.9966	3.9966	3.9967	3.9967	3.9968	3.9968	3.9969	3.9969
45 30	3.9969	3.9970	3.9970	3.9971	3.9971	3.9972	3.9972	3.9973	3.9973	3.9973
45 40	3.9974	3.9974	3.9975	3.9975	3.9976	3.9976	3.9977	3.9977	3.9977	3.9978
45 50	3.9978	3.9979	3.9979	3.9980	3.9980	3.9980	3.9981	3.9981	3.9982	3.9982
2 46 0	3.9983	3.9983	3.9983	3.9984	3.9984	3.9985	3.9985	3.9986	3.9986	3.9987
46 10	3.9987	3.9987	3.9988	3.9988	3.9989	3.9989	3.9990	3.9990	3.9991	3.9991
46 20	3.9991	3.9992	3.9992	3.9993	3.9993	3.9993	3.9994	3.9994	3.9995	3.9995
46 30	3.9996	3.9996	3.9997	3.9997	3.9997	3.9998	3.9998	3.9999	3.9999	4.0000
46 40	4.0000	4.0000	4.0001	4.0001	4.0002	4.0002	4.0003	4.0003	4.0003	4.0004
46 50	4.0004	4.0005	4.0005	4.0006	4.0006	4.0007	4.0007	4.0007	4.0008	4.0008
2 47 0	4.0009	4.0009	4.0010	4.0010	4.0010	4.0011	4.0011	4.0012	4.0012	4.0013
47 10	4.0013	4.0013	4.0014	4.0014	4.0015	4.0015	4.0016	4.0016	4.0016	4.0017
47 20	4.0017	4.0018	4.0018	4.0019	4.0019	4.0019	4.0020	4.0020	4.0021	4.0021
47 30	4.0022	4.0022	4.0023	4.0023	4.0023	4.0024	4.0024	4.0025	4.0025	4.0026
47 40	4.0026	4.0026	4.0027	4.0027	4.0028	4.0028	4.0029	4.0029	4.0029	4.0030
47 50	4.0030	4.0031	4.0031	4.0032	4.0032	4.0032	4.0033	4.0033	4.0034	4.0034
2 48 0	4.0035	4.0035	4.0035	4.0036	4.0036	4.0037	4.0037	4.0038	4.0038	4.0038
48 10	4.0039	4.0039	4.0040	4.0040	4.0041	4.0041	4.0041	4.0042	4.0043	4.0043
48 20	4.0043	4.0044	4.0044	4.0045	4.0045	4.0045	4.0046	4.0046	4.0047	4.0047
48 30	4.0048	4.0048	4.0048	4.0049	4.0049	4.0050	4.0050	4.0051	4.0051	4.0051
48 40	4.0052	4.0052	4.0053	4.0053	4.0054	4.0054	4.0055	4.0055	4.0055	4.0056
48 50	4.0056	4.0057	4.0057	4.0057	4.0058	4.0058	4.0059	4.0059	4.0060	4.0060
2 49 0	4.0060	4.0061	4.0061	4.0062	4.0062	4.0063	4.0063	4.0063	4.0064	4.0064
49 10	4.0065	4.0065	4.0066	4.0066	4.0066	4.0067	4.0067	4.0068	4.0068	4.0069
49 20	4.0069	4.0069	4.0070	4.0070	4.0071	4.0071	4.0072	4.0072	4.0073	4.0073
49 30	4.0073	4.0074	4.0074	4.0074	4.0075	4.0075	4.0076	4.0076	4.0077	4.0077
49 40	4.0077	4.0078	4.0078	4.0079	4.0079	4.0080	4.0080	4.0080	4.0081	4.0081
49 50	4.0082	4.0082	4.0083	4.0083	4.0083	4.0084	4.0084	4.0085	4.0085	4.0086

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$0^{\circ} 50' 0''$	4.0086	4.0086	4.0087	4.0087	4.0088	4.0088	4.0089	4.0089	4.0089	4.0090
50 10	4.0090	4.0091	4.0091	4.0092	4.0092	4.0092	4.0093	4.0093	4.0094	4.0094
50 20	4.0095	4.0095	4.0095	4.0096	4.0096	4.0097	4.0097	4.0097	4.0098	4.0098
50 30	4.0099	4.0099	4.0100	4.0100	4.0100	4.0101	4.0101	4.0102	4.0102	4.0103
50 40	4.0103	4.0103	4.0104	4.0104	4.0105	4.0105	4.0106	4.0106	4.0106	4.0107
50 50	4.0107	4.0108	4.0108	4.0109	4.0109	4.0109	4.0110	4.0110	4.0111	4.0111
2 51 0	4.0111	4.0112	4.0112	4.0113	4.0113	4.0114	4.0114	4.0115	4.0115	4.0115
51 10	4.0116	4.0116	4.0117	4.0117	4.0117	4.0118	4.0118	4.0119	4.0119	4.0120
51 20	4.0120	4.0120	4.0121	4.0121	4.0122	4.0122	4.0123	4.0123	4.0123	4.0124
51 30	4.0124	4.0125	4.0125	4.0125	4.0126	4.0126	4.0127	4.0127	4.0128	4.0128
51 40	4.0128	4.0129	4.0129	4.0130	4.0130	4.0130	4.0131	4.0131	4.0132	4.0132
51 50	4.0133	4.0133	4.0133	4.0134	4.0134	4.0135	4.0135	4.0136	4.0136	4.0136
2 52 0	4.0137	4.0137	4.0138	4.0138	4.0138	4.0139	4.0139	4.0140	4.0140	4.0141
52 10	4.0141	4.0141	4.0142	4.0142	4.0143	4.0143	4.0144	4.0144	4.0144	4.0145
52 20	4.0145	4.0146	4.0146	4.0146	4.0147	4.0147	4.0148	4.0148	4.0149	4.0149
52 30	4.0149	4.0150	4.0150	4.0151	4.0151	4.0152	4.0152	4.0153	4.0153	4.0153
52 40	4.0154	4.0154	4.0154	4.0155	4.0155	4.0156	4.0156	4.0157	4.0157	4.0157
52 50	4.0158	4.0158	4.0159	4.0159	4.0159	4.0160	4.0160	4.0161	4.0161	4.0162
2 53 0	4.0162	4.0162	4.0163	4.0163	4.0164	4.0164	4.0165	4.0165	4.0166	4.0166
53 10	4.0166	4.0167	4.0167	4.0167	4.0168	4.0168	4.0169	4.0169	4.0169	4.0170
53 20	4.0170	4.0171	4.0171	4.0172	4.0172	4.0172	4.0173	4.0173	4.0174	4.0174
53 30	4.0175	4.0175	4.0175	4.0176	4.0176	4.0177	4.0177	4.0177	4.0178	4.0178
53 40	4.0179	4.0179	4.0180	4.0180	4.0180	4.0181	4.0181	4.0182	4.0182	4.0182
53 50	4.0183	4.0183	4.0184	4.0184	4.0185	4.0185	4.0185	4.0186	4.0186	4.0187
2 54 0	4.0187	4.0187	4.0188	4.0188	4.0189	4.0189	4.0190	4.0190	4.0190	4.0191
54 10	4.0191	4.0192	4.0192	4.0192	4.0193	4.0193	4.0194	4.0194	4.0194	4.0195
54 20	4.0195	4.0196	4.0196	4.0197	4.0197	4.0197	4.0198	4.0198	4.0199	4.0199
54 30	4.0199	4.0200	4.0200	4.0201	4.0201	4.0202	4.0202	4.0203	4.0203	4.0203
54 40	4.0204	4.0204	4.0204	4.0205	4.0205	4.0206	4.0206	4.0207	4.0207	4.0207
54 50	4.0208	4.0208	4.0209	4.0209	4.0209	4.0210	4.0210	4.0211	4.0211	4.0211
2 55 0	4.0212	4.0212	4.0213	4.0213	4.0214	4.0214	4.0215	4.0215	4.0216	4.0216
55 10	4.0216	4.0216	4.0217	4.0217	4.0218	4.0218	4.0219	4.0219	4.0219	4.0220
55 20	4.0220	4.0221	4.0221	4.0221	4.0222	4.0222	4.0223	4.0223	4.0223	4.0224
55 30	4.0224	4.0225	4.0225	4.0225	4.0226	4.0226	4.0227	4.0227	4.0228	4.0228
55 40	4.0228	4.0229	4.0229	4.0230	4.0230	4.0230	4.0231	4.0231	4.0232	4.0232
55 50	4.0233	4.0233	4.0233	4.0234	4.0234	4.0235	4.0235	4.0235	4.0236	4.0236
2 56 0	4.0237	4.0237	4.0237	4.0238	4.0238	4.0239	4.0239	4.0240	4.0240	4.0240
56 10	4.0241	4.0241	4.0242	4.0242	4.0242	4.0243	4.0243	4.0244	4.0244	4.0244
56 20	4.0245	4.0245	4.0246	4.0246	4.0246	4.0247	4.0247	4.0248	4.0248	4.0249
56 30	4.0249	4.0249	4.0250	4.0250	4.0251	4.0251	4.0251	4.0252	4.0252	4.0253
56 40	4.0253	4.0253	4.0254	4.0254	4.0255	4.0255	4.0256	4.0256	4.0256	4.0257
56 50	4.0257	4.0258	4.0258	4.0258	4.0259	4.0259	4.0260	4.0260	4.0260	4.0261
2 57 0	4.0261	4.0262	4.0262	4.0262	4.0263	4.0263	4.0264	4.0264	4.0265	4.0265
57 10	4.0265	4.0266	4.0266	4.0267	4.0267	4.0267	4.0268	4.0268	4.0269	4.0269
57 20	4.0269	4.0270	4.0270	4.0271	4.0271	4.0271	4.0272	4.0272	4.0273	4.0273
57 30	4.0273	4.0274	4.0274	4.0275	4.0275	4.0276	4.0276	4.0276	4.0277	4.0277
57 40	4.0278	4.0278	4.0278	4.0279	4.0279	4.0280	4.0280	4.0280	4.0281	4.0281
57 50	4.0282	4.0282	4.0282	4.0283	4.0283	4.0284	4.0284	4.0284	4.0285	4.0285
2 58 0	4.0286	4.0286	4.0287	4.0287	4.0287	4.0288	4.0288	4.0289	4.0289	4.0289
58 10	4.0290	4.0290	4.0291	4.0291	4.0291	4.0292	4.0292	4.0293	4.0293	4.0293
58 20	4.0294	4.0294	4.0295	4.0295	4.0295	4.0296	4.0296	4.0297	4.0297	4.0297
58 30	4.0298	4.0298	4.0299	4.0299	4.0300	4.0300	4.0300	4.0301	4.0301	4.0302
58 40	4.0302	4.0302	4.0303	4.0303	4.0304	4.0304	4.0304	4.0305	4.0305	4.0306
58 50	4.0306	4.0306	4.0307	4.0307	4.0308	4.0308	4.0308	4.0309	4.0309	4.0310
2 59 0	4.0310	4.0310	4.0311	4.0311	4.0312	4.0312	4.0312	4.0313	4.0313	4.0314
59 10	4.0314	4.0314	4.0315	4.0315	4.0316	4.0316	4.0317	4.0317	4.0317	4.0318
59 20	4.0318	4.0319	4.0319	4.0319	4.0320	4.0320	4.0321	4.0321	4.0321	4.0322
59 30	4.0322	4.0323	4.0323	4.0323	4.0324	4.0324	4.0325	4.0325	4.0325	4.0326
59 40	4.0326	4.0327	4.0327	4.0327	4.0328	4.0328	4.0329	4.0329	4.0329	4.0330
59 50	4.0330	4.0331	4.0331	4.0331	4.0332	4.0332	4.0333	4.0333	4.0333	4.0334

TABLE II.

TABLE, SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF
SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING
THE GREENWICH TIME CORRESPONDING TO A
CORRECTED LUNAR DISTANCE.

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																															
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52						
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.						
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3						
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6						
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9						
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11						
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13						
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14						
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15						
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16						
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16						

Difference of the Proportional Logarithms in the Ephemeris.																															
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.				
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0 10	2 50	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	7	7				
0 20	2 40	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13				
0 30	2 30	9	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	17	18	18				
0 40	2 20	12	12	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21	22	22	22				
0 50	2 10	14	14	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	23	23	23	24	24	24	25	25	26				
1 0	2 0	15	16	16	17	17	18	18	19	20	21	21	22	22	23	23	24	24	25	25	26	26	27	27	28	28	28				
1 10	1 50	16	17	17	18	18	19	20	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30	30				
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31	31				
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	32	32				

Difference of the Proportional Logarithms in the Ephemeris.															
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	8	8	8	8	8	8	8	9
0 20	2 40	13	13	13	14	14	14	14	15	15	15	15	15	16	16
0 30	2 30	18	18	19	19	19	20	20	21	21	21	21	22	22	23
0 40	2 20	22	23	23	24	24	25	25	26	26	27	27	28	28	29
0 50	2 10	26	26	27	27	28	29	29	30	30	31	31	32	32	33
1 0	2 0	29	29	30	30	31	31	32	33	33	34	34	35	35	36
1 10	1 50	31	31	32	32	33	34	34	35	35	36	37	37	38	39
1 20	1 40	32	33	33	34	34	35	35	36	37	38	38	39	39	40
1 30	1 30	32	33	34	34	35	35	36	36	37	38	39	39	40	41

The Correction is to be added to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal.	0 h.	1 h.	2 h.	3 h.	4 h.	5 h.	6 h.	7 h.	For Seconds.
m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	0 00.000	0 09.830	0 19.859	0 29.489	0 39.318	0 49.148	0 58.977	1 08.807	1 0.003
1	0 00.164	0 09.993	0 19.823	0 29.553	0 39.482	0 49.312	0 59.141	1 08.971	2 .005
2	0 00.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 09.135	3 .008
3	0 00.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 09.298	4 .011
4	0 00.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 09.462	5 .014
5	0 00.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 09.626	6 .016
6	0 00.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 09.790	7 .019
7	0 01.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 00.124	1 09.954	8 .022
8	0 01.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 00.288	1 10.118	9 .025
9	0 01.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 00.452	1 10.281	10 .027
10	0 01.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 00.616	1 10.445	11 .030
11	0 01.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 00.779	1 10.609	12 .033
12	0 01.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 00.943	1 10.773	13 .035
13	0 02.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 01.107	1 10.937	14 .038
14	0 02.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 01.271	1 11.100	15 .041
15	0 02.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 01.435	1 11.264	16 .044
16	0 02.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 01.599	1 11.428	17 .046
17	0 02.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 01.762	1 11.592	18 .049
18	0 02.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 01.926	1 11.756	19 .052
19	0 03.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 02.090	1 11.920	20 .055
20	0 03.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 02.254	1 12.083	21 .057
21	0 03.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 02.418	1 12.247	22 .060
22	0 03.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 02.582	1 12.411	23 .063
23	0 03.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 02.745	1 12.575	24 .066
24	0 03.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 02.909	1 12.739	25 .068
25	0 04.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 03.073	1 12.903	26 .071
26	0 04.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 03.237	1 13.066	27 .074
27	0 04.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 03.401	1 13.230	28 .076
28	0 04.587	0 14.417	0 24.246	0 34.076	0 43.906	0 53.735	1 03.564	1 13.394	29 .079
29	0 04.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 03.728	1 13.558	30 .082
30	0 04.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 03.892	1 13.722	31 .085
31	0 05.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 04.056	1 13.886	32 .087
32	0 05.243	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 04.220	1 14.049	33 .090
33	0 05.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 04.384	1 14.213	34 .093
34	0 05.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 04.547	1 14.377	35 .096
35	0 05.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 04.711	1 14.541	36 .098
36	0 05.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 04.875	1 14.705	37 .101
37	0 06.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 05.039	1 14.868	38 .104
38	0 06.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 05.203	1 15.032	39 .106
39	0 06.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 05.367	1 15.196	40 .109
40	0 06.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 05.530	1 15.360	41 .112
41	0 06.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 05.694	1 15.524	42 .115
42	0 06.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 05.858	1 15.688	43 .117
43	0 07.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 06.022	1 15.851	44 .120
44	0 07.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 06.186	1 16.015	45 .123
45	0 07.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 06.350	1 16.179	46 .126
46	0 07.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 06.513	1 16.343	47 .128
47	0 07.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 06.677	1 16.507	48 .131
48	0 07.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 06.841	1 16.671	49 .134
49	0 08.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 07.005	1 16.834	50 .137
50	0 08.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 07.169	1 16.998	51 .139
51	0 08.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 07.332	1 17.162	52 .142
52	0 08.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 07.496	1 17.326	53 .145
53	0 08.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 07.660	1 17.490	54 .147
54	0 08.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 07.824	1 17.654	55 .150
55	0 09.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 07.988	1 17.817	56 .153
56	0 09.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 08.152	1 17.981	57 .156
57	0 09.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 08.315	1 18.145	58 .158
58	0 09.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 08.479	1 18.309	59 .161
59	0 09.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 08.643	1 18.473	

TABLE III. SIDEREAL INTO MEAN SOLAR TIME

Sidereal.	8 h.	9 h.	10 h.	11 h.	12 h.	13 h.	14 h.	15 h.	For Seconds.
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s.
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 07.784	2 17.614	2 27.443	1 0.003
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 07.948	2 17.778	2 27.607	2 .005
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 08.112	2 17.941	2 27.771	3 .008
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 08.276	2 18.105	2 27.935	4 .011
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 08.440	2 18.269	2 28.099	5 .014
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 08.603	2 18.433	2 28.263	6 .016
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 08.767	2 18.597	2 28.426	7 .019
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 08.931	2 18.761	2 28.590	8 .022
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 09.095	2 18.924	2 28.754	9 .025
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 09.259	2 19.088	2 28.918	10 .027
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 09.423	2 19.252	2 29.082	11 .030
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 09.586	2 19.416	2 29.245	12 .033
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 09.750	2 19.580	2 29.409	13 .035
13	1 20.766	1 30.596	1 40.425	1 50.255	2 00.084	2 09.914	2 19.744	2 29.573	14 .038
14	1 20.930	1 30.760	1 40.589	1 50.419	2 00.248	2 10.078	2 19.907	2 29.737	15 .041
15	1 21.094	1 30.923	1 40.753	1 50.583	2 00.412	2 10.242	2 20.071	2 29.901	16 .044
16	1 21.258	1 31.087	1 40.917	1 50.746	2 00.576	2 10.405	2 20.235	2 30.065	17 .046
17	1 21.422	1 31.251	1 41.081	1 50.910	2 00.740	2 10.569	2 20.399	2 30.228	18 .049
18	1 21.585	1 31.415	1 41.244	1 51.074	2 00.904	2 10.733	2 20.563	2 30.392	19 .052
19	1 21.749	1 31.579	1 41.408	1 51.238	2 01.067	2 10.897	2 20.727	2 30.556	20 .055
20	1 21.913	1 31.743	1 41.572	1 51.402	2 01.231	2 11.061	2 20.890	2 30.720	21 .057
21	1 22.077	1 31.906	1 41.736	1 51.565	2 01.395	2 11.225	2 21.054	2 30.884	22 .060
22	1 22.241	1 32.070	1 41.900	1 51.729	2 01.559	2 11.388	2 21.218	2 31.048	23 .063
23	1 22.404	1 32.234	1 42.064	1 51.893	2 01.723	2 11.552	2 21.382	2 31.211	24 .066
24	1 22.568	1 32.398	1 42.227	1 52.057	2 01.887	2 11.716	2 21.546	2 31.375	25 .068
25	1 22.732	1 32.562	1 42.391	1 52.221	2 02.050	2 11.880	2 21.709	2 31.539	26 .071
26	1 22.896	1 32.726	1 42.555	1 52.385	2 02.214	2 12.044	2 21.873	2 31.703	27 .074
27	1 23.060	1 32.889	1 42.719	1 52.548	2 02.378	2 12.208	2 22.037	2 31.867	28 .076
28	1 23.224	1 33.053	1 42.883	1 52.712	2 02.542	2 12.371	2 22.201	2 32.031	29 .079
29	1 23.387	1 33.217	1 43.047	1 52.876	2 02.706	2 12.535	2 22.365	2 32.194	30 .082
30	1 23.551	1 33.381	1 43.210	1 53.040	2 02.869	2 12.699	2 22.529	2 32.358	31 .085
31	1 23.715	1 33.545	1 43.374	1 53.204	2 03.033	2 12.863	2 22.692	2 32.522	32 .087
32	1 23.879	1 33.708	1 43.538	1 53.368	2 03.197	2 13.027	2 22.856	2 32.686	33 .090
33	1 24.043	1 33.872	1 43.702	1 53.531	2 03.361	2 13.191	2 23.020	2 32.850	34 .098
34	1 24.207	1 34.036	1 43.866	1 53.695	2 03.525	2 13.354	2 23.184	2 33.013	35 .096
35	1 24.370	1 34.200	1 44.029	1 53.859	2 03.689	2 13.518	2 23.348	2 33.177	36 .098
36	1 24.534	1 34.364	1 44.193	1 54.023	2 03.852	2 13.682	2 23.512	2 33.341	37 .101
37	1 24.698	1 34.528	1 44.357	1 54.187	2 04.016	2 13.846	2 23.675	2 33.505	38 .104
38	1 24.862	1 34.691	1 44.521	1 54.351	2 04.180	2 14.010	2 23.839	2 33.669	39 .106
39	1 25.026	1 34.855	1 44.685	1 54.514	2 04.344	2 14.173	2 24.003	2 33.833	40 .109
40	1 25.190	1 35.019	1 44.849	1 54.678	2 04.508	2 14.337	2 24.167	2 33.996	41 .112
41	1 25.353	1 35.183	1 45.012	1 54.842	2 04.672	2 14.501	2 24.331	2 34.160	42 .115
42	1 25.517	1 35.347	1 45.176	1 55.006	2 04.835	2 14.665	2 24.495	2 34.324	43 .117
43	1 25.681	1 35.511	1 45.340	1 55.170	2 04.999	2 14.829	2 24.658	2 34.488	44 .120
44	1 25.845	1 35.674	1 45.504	1 55.333	2 05.163	2 14.993	2 24.822	2 34.652	45 .123
45	1 26.009	1 35.838	1 45.668	1 55.497	2 05.327	2 15.156	2 24.986	2 34.816	46 .126
46	1 26.172	1 36.002	1 45.832	1 55.661	2 05.491	2 15.320	2 25.150	2 34.979	47 .128
47	1 26.336	1 36.166	1 45.995	1 55.825	2 05.655	2 15.484	2 25.314	2 35.143	48 .131
48	1 26.500	1 36.330	1 46.159	1 55.989	2 05.818	2 15.648	2 25.477	2 35.307	49 .134
49	1 26.664	1 36.493	1 46.323	1 56.153	2 05.982	2 15.812	2 25.641	2 35.471	50 .137
50	1 26.828	1 36.657	1 46.487	1 56.316	2 06.146	2 15.976	2 25.805	2 35.635	51 .139
51	1 26.992	1 36.821	1 46.651	1 56.480	2 06.310	2 16.139	2 25.969	2 35.798	52 .142
52	1 27.155	1 36.985	1 46.815	1 56.644	2 06.474	2 16.303	2 26.133	2 35.962	53 .145
53	1 27.319	1 37.149	1 46.978	1 56.808	2 06.637	2 16.467	2 26.297	2 36.126	54 .147
54	1 27.483	1 37.313	1 47.142	1 56.972	2 06.801	2 16.631	2 26.460	2 36.290	55 .150
55	1 27.647	1 37.476	1 47.306	1 57.136	2 06.965	2 16.795	2 26.624	2 36.454	56 .153
56	1 27.811	1 37.640	1 47.470	1 57.299	2 07.129	2 16.959	2 26.788	2 36.618	57 .156
57	1 27.975	1 37.804	1 47.634	1 57.463	2 07.293	2 17.123	2 26.952	2 36.781	58 .158
58	1 28.138	1 37.968	1 47.797	1 57.627	2 07.457	2 17.286	2 27.116	2 36.945	59 .161
59	1 28.302	1 38.132	1 47.961	1 57.791	2 07.620	2 17.450	2 27.280	2 37.109	

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	2 37.273	2 47.102	2 56.982	3 06.762	3 16.591	3 26.421	3 36.250	3 46.080	1 0.003
1	2 37.437	2 47.266	2 57.096	3 06.925	3 16.755	3 26.585	3 36.414	3 46.244	2 .005
2	2 37.601	2 47.430	2 57.260	3 07.089	3 16.919	3 26.748	3 36.578	3 46.407	3 .008
3	2 37.764	2 47.594	2 57.424	3 07.253	3 17.083	3 26.912	3 36.742	3 46.571	4 .011
4	2 37.928	2 47.758	2 57.587	3 07.417	3 17.246	3 27.076	3 36.906	3 46.735	5 .014
5	2 38.092	2 47.922	2 57.751	3 07.581	3 17.410	3 27.240	3 37.069	3 46.899	6 .016
6	2 38.256	2 48.085	2 57.915	3 07.745	3 17.574	3 27.404	3 37.233	3 47.063	7 .019
7	2 38.420	2 48.249	2 58.079	3 07.908	3 17.738	3 27.568	3 37.397	3 47.227	8 .022
8	2 38.584	2 48.413	2 58.243	3 08.072	3 17.902	3 27.731	3 37.561	3 47.390	9 .025
9	2 38.747	2 48.577	2 58.406	3 08.236	3 18.066	3 27.895	3 37.725	3 47.554	10 .027
10	2 38.911	2 48.741	2 58.570	3 08.400	3 18.229	3 28.059	3 37.889	3 47.718	11 .030
11	2 39.075	2 48.905	2 58.734	3 08.564	3 18.393	3 28.223	3 38.052	3 47.882	12 .033
12	2 39.239	2 49.068	2 58.898	3 08.728	3 18.557	3 28.387	3 38.216	3 48.046	13 .035
13	2 39.403	2 49.232	2 59.062	3 08.891	3 18.721	3 28.550	3 38.380	3 48.210	14 .038
14	2 39.566	2 49.396	2 59.226	3 09.055	3 18.885	3 28.714	3 38.544	3 48.373	15 .041
15	2 39.730	2 49.560	2 59.389	3 09.219	3 19.049	3 28.878	3 38.708	3 48.537	16 .044
16	2 39.894	2 49.724	2 59.553	3 09.383	3 19.212	3 29.042	3 38.871	3 48.701	17 .046
17	2 40.058	2 49.888	2 59.717	3 09.547	3 19.376	3 29.206	3 39.035	3 48.865	18 .049
18	2 40.222	2 50.051	2 59.881	3 09.710	3 19.540	3 29.370	3 39.199	3 49.029	19 .052
19	2 40.386	2 50.215	3 00.045	3 09.874	3 19.704	3 29.533	3 39.363	3 49.193	20 .055
20	2 40.549	2 50.379	3 00.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	21 .057
21	2 40.713	2 50.543	3 00.373	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	22 .060
22	2 40.877	2 50.707	3 00.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	23 .063
23	2 41.041	2 50.870	3 00.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	24 .066
24	2 41.205	2 51.034	3 00.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	25 .068
25	2 41.369	2 51.198	3 01.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	26 .071
26	2 41.532	2 51.362	3 01.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	27 .074
27	2 41.696	2 51.526	3 01.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	28 .076
28	2 41.860	2 51.690	3 01.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	29 .079
29	2 42.024	2 51.853	3 01.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	30 .082
30	2 42.188	2 52.017	3 01.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	31 .085
31	2 42.352	2 52.181	3 02.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	32 .087
32	2 42.515	2 52.345	3 02.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	33 .090
33	2 42.679	2 52.509	3 02.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	34 .093
34	2 42.843	2 52.673	3 02.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	35 .096
35	2 43.007	2 52.836	3 02.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	36 .098
36	2 43.171	2 53.000	3 02.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	37 .101
37	2 43.334	2 53.164	3 02.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	38 .104
38	2 43.498	2 53.328	3 03.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	39 .106
39	2 43.662	2 53.492	3 03.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	40 .109
40	2 43.826	2 53.656	3 03.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	41 .112
41	2 43.990	2 53.819	3 03.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	42 .115
42	2 44.154	2 53.983	3 03.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	43 .117
43	2 44.317	2 54.147	3 03.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	44 .120
44	2 44.481	2 54.311	3 04.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	45 .123
45	2 44.645	2 54.475	3 04.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	46 .126
46	2 44.809	2 54.638	3 04.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	47 .128
47	2 44.973	2 54.802	3 04.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	48 .131
48	2 45.137	2 54.966	3 04.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	49 .134
49	2 45.300	2 55.130	3 04.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	50 .137
50	2 45.464	2 55.294	3 05.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	51 .139
51	2 45.628	2 55.458	3 05.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	52 .142
52	2 45.792	2 55.621	3 05.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	53 .145
53	2 45.956	2 55.785	3 05.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	54 .147
54	2 46.120	2 55.949	3 05.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	55 .150
55	2 46.283	2 56.113	3 05.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	56 .153
56	2 46.447	2 56.277	3 06.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	57 .156
57	2 46.611	2 56.441	3 06.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	58 .158
58	2 46.775	2 56.604	3 06.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	59 .161
59	2 46.939	2 56.768	3 06.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	

TABLE III. MEAN SOLAR INTO SIDEREAL TIME

Mean Solar.	0 ^h .	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .	7 ^h .	For Seconds.
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	0 00.000	0 09.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 08.995	
1	0 00.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.308	1 09.160	1 0.003
2	0 00.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 09.324	2 .005
3	0 00.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 09.488	3 .008
4	0 00.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 09.652	4 .011
5	0 00.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 09.817	5 .014
6	0 00.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 00.124	1 09.981	6 .016
7	0 01.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 00.289	1 10.145	7 .019
8	0 01.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 00.453	1 10.310	8 .022
9	0 01.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 00.617	1 10.474	9 .025
10	0 01.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 00.782	1 10.638	10 .027
11	0 01.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 00.946	1 10.802	11 .030
12	0 01.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 01.110	1 10.967	12 .033
13	0 02.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 01.274	1 11.131	13 .036
14	0 02.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 01.439	1 11.295	14 .038
15	0 02.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 01.603	1 11.459	15 .041
16	0 02.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 01.767	1 11.624	16 .044
17	0 02.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 01.932	1 11.788	17 .047
18	0 02.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 02.096	1 11.952	18 .049
19	0 03.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 02.260	1 12.117	19 .052
20	0 03.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 02.424	1 12.281	20 .055
21	0 03.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 02.589	1 12.445	21 .057
22	0 03.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 02.753	1 12.609	22 .060
23	0 03.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 02.917	1 12.774	23 .063
24	0 03.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 03.081	1 12.938	24 .066
25	0 04.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 03.246	1 13.102	25 .068
26	0 04.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 03.410	1 13.266	26 .071
27	0 04.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 03.574	1 13.431	27 .074
28	0 04.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 03.739	1 13.595	28 .077
29	0 04.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 03.903	1 13.759	29 .079
30	0 04.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 04.067	1 13.924	30 .082
31	0 05.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 04.231	1 14.088	31 .085
32	0 05.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 04.396	1 14.252	32 .088
33	0 05.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 04.560	1 14.416	33 .090
34	0 05.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 04.724	1 14.581	34 .093
35	0 05.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 04.888	1 14.745	35 .096
36	0 05.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 05.053	1 14.909	36 .099
37	0 06.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 05.217	1 15.073	37 .101
38	0 06.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 05.381	1 15.238	38 .104
39	0 06.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 05.546	1 15.402	39 .107
40	0 06.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 05.710	1 15.566	40 .110
41	0 06.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 05.874	1 15.731	41 .112
42	0 06.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 06.038	1 15.895	42 .115
43	0 07.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 06.203	1 16.059	43 .118
44	0 07.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 06.367	1 16.223	44 .120
45	0 07.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 06.531	1 16.388	45 .123
46	0 07.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 06.695	1 16.552	46 .126
47	0 07.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 06.860	1 16.716	47 .129
48	0 07.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 07.024	1 16.881	48 .131
49	0 08.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 07.188	1 17.045	49 .134
50	0 08.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 07.353	1 17.209	50 .137
51	0 08.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 07.517	1 17.373	51 .140
52	0 08.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 07.681	1 17.538	52 .142
53	0 08.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 07.845	1 17.702	53 .145
54	0 08.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 08.010	1 17.866	54 .148
55	0 09.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 08.174	1 18.030	55 .151
56	0 09.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 08.338	1 18.195	56 .153
57	0 09.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 08.502	1 18.359	57 .156
58	0 09.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 08.667	1 18.523	58 .159
59	0 09.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 08.831	1 18.688	59 .162

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

Mean Solar.	8 h.	9 h.	10 h.	11 h.	12 h.	13 h.	14 h.	15 h.	For Seconds.
m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	a. s.
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 08.134	2 17.991	2 27.847	1 0.003
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 08.298	2 18.155	2 28.011	2 .005
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 08.463	2 18.319	2 28.176	3 .008
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 08.627	2 18.483	2 28.340	4 .011
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 08.791	2 18.648	2 28.504	5 .014
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 08.956	2 18.812	2 28.668	6 .016
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 09.120	2 18.976	2 28.833	7 .019
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 09.284	2 19.141	2 28.997	8 .022
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 09.448	2 19.305	2 29.161	9 .025
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 09.613	2 19.469	2 29.326	10 .027
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 09.777	2 19.633	2 29.490	11 .030
11	1 20.659	1 30.515	1 40.372	1 50.228	2 00.085	2 09.941	2 19.798	2 29.654	12 .033
12	1 20.823	1 30.680	1 40.536	1 50.393	2 00.249	2 10.105	2 19.962	2 29.818	13 .036
13	1 20.987	1 30.844	1 40.700	1 50.557	2 00.413	2 10.270	2 20.126	2 29.983	14 .038
14	1 21.152	1 31.008	1 40.865	1 50.721	2 00.578	2 10.434	2 20.290	2 30.147	15 .041
15	1 21.316	1 31.172	1 41.029	1 50.885	2 00.742	2 10.598	2 20.455	2 30.311	16 .044
16	1 21.480	1 31.337	1 41.193	1 51.050	2 00.906	2 10.763	2 20.619	2 30.476	17 .047
17	1 21.644	1 31.501	1 41.357	1 51.214	2 01.070	2 10.927	2 20.783	2 30.640	18 .049
18	1 21.809	1 31.665	1 41.522	1 51.378	2 01.235	2 11.091	2 20.948	2 30.804	19 .052
19	1 21.973	1 31.829	1 41.686	1 51.542	2 01.399	2 11.255	2 21.112	2 30.968	20 .055
20	1 22.137	1 31.994	1 41.850	1 51.707	2 01.563	2 11.420	2 21.276	2 31.133	21 .057
21	1 22.302	1 32.158	1 42.015	1 51.871	2 01.727	2 11.584	2 21.440	2 31.297	22 .060
22	1 22.466	1 32.322	1 42.179	1 52.035	2 01.892	2 11.748	2 21.605	2 31.461	23 .063
23	1 22.630	1 32.487	1 42.343	1 52.200	2 02.056	2 11.912	2 21.769	2 31.625	24 .066
24	1 22.794	1 32.651	1 42.507	1 52.364	2 02.220	2 12.077	2 21.933	2 31.790	25 .068
25	1 22.959	1 32.815	1 42.672	1 52.528	2 02.385	2 12.241	2 22.098	2 31.954	26 .071
26	1 23.123	1 32.979	1 42.836	1 52.692	2 02.549	2 12.405	2 22.262	2 32.118	27 .074
27	1 23.287	1 33.144	1 43.000	1 52.857	2 02.713	2 12.570	2 22.426	2 32.283	28 .077
28	1 23.451	1 33.308	1 43.164	1 53.021	2 02.877	2 12.734	2 22.590	2 32.447	29 .079
29	1 23.616	1 33.472	1 43.329	1 53.185	2 03.042	2 12.898	2 22.755	2 32.611	30 .082
30	1 23.780	1 33.637	1 43.493	1 53.349	2 03.206	2 13.062	2 22.919	2 32.775	31 .085
31	1 23.944	1 33.801	1 43.657	1 53.514	2 03.370	2 13.227	2 23.083	2 32.940	32 .088
32	1 24.109	1 33.965	1 43.822	1 53.678	2 03.534	2 13.391	2 23.247	2 33.104	33 .090
33	1 24.273	1 34.129	1 43.986	1 53.842	2 03.699	2 13.555	2 23.412	2 33.268	34 .093
34	1 24.437	1 34.294	1 44.150	1 54.007	2 03.863	2 13.720	2 23.576	2 33.432	35 .096
35	1 24.601	1 34.458	1 44.314	1 54.171	2 04.027	2 13.884	2 23.740	2 33.597	36 .099
36	1 24.766	1 34.622	1 44.479	1 54.335	2 04.192	2 14.048	2 23.905	2 33.761	37 .101
37	1 24.930	1 34.786	1 44.643	1 54.499	2 04.356	2 14.212	2 24.069	2 33.925	38 .104
38	1 25.094	1 34.951	1 44.807	1 54.664	2 04.520	2 14.377	2 24.233	2 34.090	39 .107
39	1 25.259	1 35.115	1 44.971	1 54.828	2 04.684	2 14.541	2 24.397	2 34.254	40 .110
40	1 25.423	1 35.279	1 45.136	1 54.992	2 04.849	2 14.705	2 24.562	2 34.418	41 .112
41	1 25.587	1 35.444	1 45.300	1 55.156	2 05.013	2 14.869	2 24.726	2 34.582	42 .115
42	1 25.751	1 35.608	1 45.464	1 55.321	2 05.177	2 15.034	2 24.890	2 34.747	43 .118
43	1 25.916	1 35.772	1 45.629	1 55.485	2 05.342	2 15.198	2 25.054	2 34.911	44 .120
44	1 26.080	1 35.936	1 45.793	1 55.649	2 05.506	2 15.362	2 25.219	2 35.075	45 .123
45	1 26.244	1 36.101	1 45.957	1 55.814	2 05.670	2 15.527	2 25.383	2 35.239	46 .126
46	1 26.408	1 36.265	1 46.121	1 55.978	2 05.834	2 15.691	2 25.547	2 35.404	47 .129
47	1 26.573	1 36.429	1 46.286	1 56.142	2 05.999	2 15.855	2 25.712	2 35.568	48 .131
48	1 26.737	1 36.593	1 46.450	1 56.306	2 06.163	2 16.019	2 25.876	2 35.732	49 .134
49	1 26.901	1 36.758	1 46.614	1 56.471	2 06.327	2 16.184	2 26.040	2 35.897	50 .137
50	1 27.066	1 36.922	1 46.778	1 56.635	2 06.491	2 16.348	2 26.204	2 36.061	51 .140
51	1 27.230	1 37.086	1 46.943	1 56.799	2 06.656	2 16.512	2 26.369	2 36.225	52 .142
52	1 27.394	1 37.251	1 47.107	1 56.964	2 06.820	2 16.676	2 26.533	2 36.389	53 .145
53	1 27.558	1 37.415	1 47.271	1 57.128	2 06.984	2 16.841	2 26.697	2 36.554	54 .148
54	1 27.723	1 37.579	1 47.436	1 57.292	2 07.149	2 17.005	2 26.861	2 36.718	55 .151
55	1 27.887	1 37.743	1 47.600	1 57.456	2 07.313	2 17.169	2 27.026	2 36.882	56 .153
56	1 28.051	1 37.908	1 47.764	1 57.621	2 07.477	2 17.334	2 27.190	2 37.047	57 .156
57	1 28.215	1 38.072	1 47.928	1 57.785	2 07.641	2 17.498	2 27.354	2 37.211	58 .159
58	1 28.380	1 38.236	1 48.093	1 57.949	2 07.806	2 17.662	2 27.519	2 37.375	59 .162
59	1 28.544	1 38.400	1 48.257	1 58.113	2 07.970	2 17.826	2 27.683	2 37.539	

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

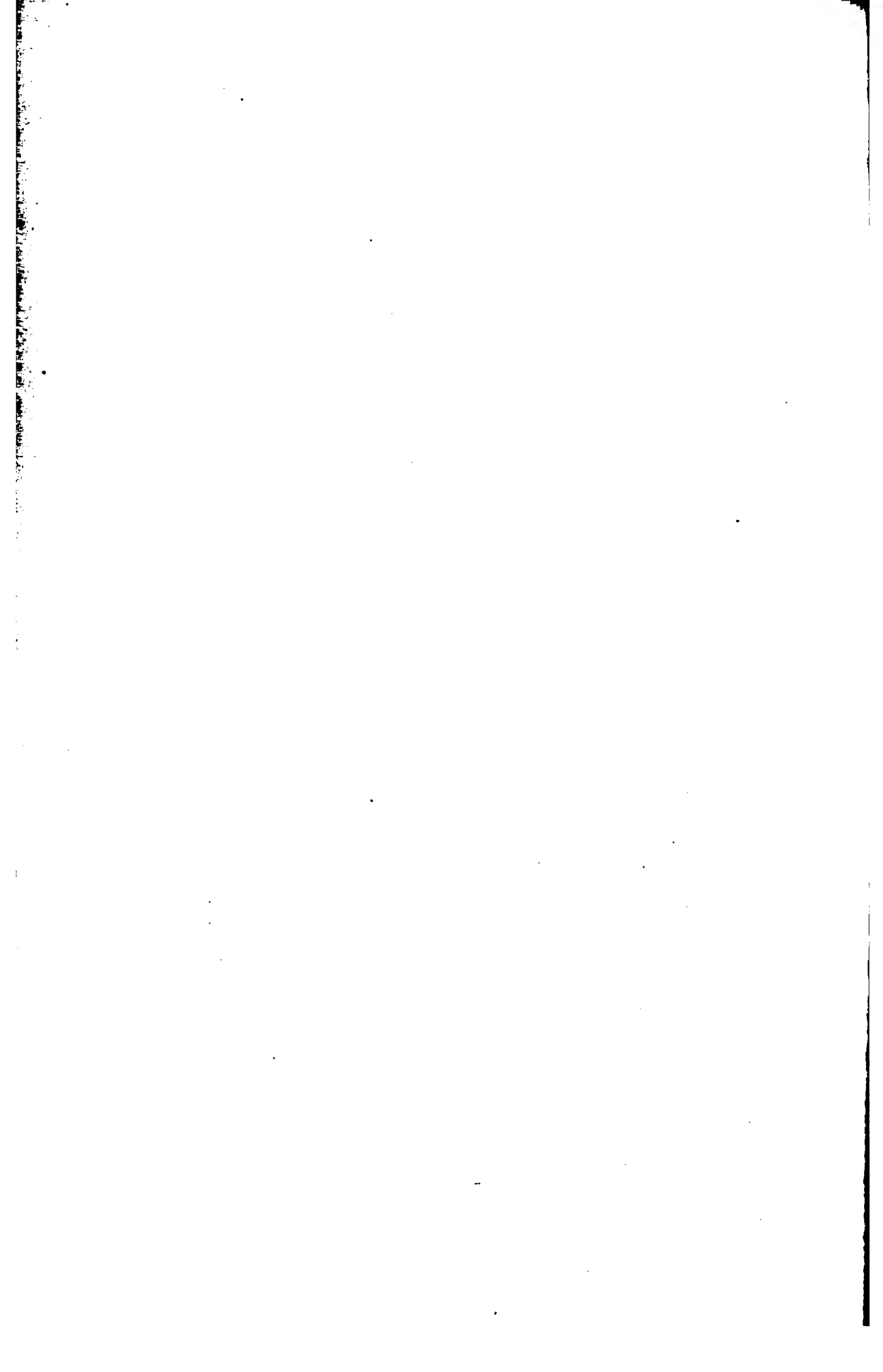
Mean Solar.	16 ^h .	17 ^h .	18 ^h .	19 ^h .	20 ^h .	21 ^h .	22 ^h .	23 ^h .	For Seconds.
m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	s. s.
0	2 37.704	2 47.560	2 57.417	3 07.273	3 17.129	3 26.986	3 36.842	3 46.699	1 0.003
1	2 37.868	2 47.724	2 57.581	3 07.437	3 17.294	3 27.150	3 37.007	3 46.863	2 .006
2	2 38.032	2 47.889	2 57.745	3 07.602	3 17.458	3 27.315	3 37.171	3 47.027	3 .008
3	2 38.196	2 48.053	2 57.909	3 07.766	3 17.622	3 27.479	3 37.335	3 47.192	4 .011
4	2 38.361	2 48.217	2 58.074	3 07.930	3 17.787	3 27.643	3 37.500	3 47.356	5 .014
5	2 38.525	2 48.381	2 58.238	3 08.094	3 17.951	3 27.807	3 37.664	3 47.520	6 .016
6	2 38.689	2 48.546	2 58.402	3 08.259	3 18.115	3 27.972	3 37.828	3 47.685	7 .019
7	2 38.854	2 48.710	2 58.566	3 08.423	3 18.279	3 28.136	3 37.992	3 47.849	8 .022
8	2 39.018	2 48.874	2 58.731	3 08.587	3 18.444	3 28.300	3 38.157	3 48.013	9 .025
9	2 39.182	2 49.039	2 58.895	3 08.751	3 18.608	3 28.464	3 38.321	3 48.177	10 .027
10	2 39.346	2 49.203	2 59.059	3 08.916	3 18.772	3 28.629	3 38.485	3 48.342	11 .030
11	2 39.511	2 49.367	2 59.224	3 09.080	3 18.937	3 28.793	3 38.649	3 48.506	12 .033
12	2 39.675	2 49.531	2 59.388	3 09.244	3 19.101	3 28.957	3 38.814	3 48.670	13 .036
13	2 39.839	2 49.696	2 59.552	3 09.409	3 19.265	3 29.122	3 38.978	3 48.834	14 .038
14	2 40.003	2 49.860	2 59.716	3 09.573	3 19.429	3 29.286	3 39.142	3 48.999	15 .041
15	2 40.168	2 50.024	2 59.881	3 09.737	3 19.594	3 29.450	3 39.307	3 49.163	16 .044
16	2 40.332	2 50.188	3 00.045	3 09.901	3 19.758	3 29.614	3 39.471	3 49.327	17 .047
17	2 40.496	2 50.353	3 00.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	18 .049
18	2 40.661	2 50.517	3 00.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	19 .052
19	2 40.825	2 50.681	3 00.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	20 .055
20	2 40.989	2 50.846	3 00.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	21 .057
21	2 41.153	2 51.010	3 00.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	22 .060
22	2 41.318	2 51.174	3 01.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	23 .063
23	2 41.482	2 51.338	3 01.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	24 .066
24	2 41.646	2 51.503	3 01.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	25 .068
25	2 41.810	2 51.667	3 01.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	26 .071
26	2 41.975	2 51.831	3 01.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	27 .074
27	2 42.139	2 51.995	3 01.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	28 .077
28	2 42.303	2 52.160	3 02.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	29 .079
29	2 42.468	2 52.324	3 02.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	30 .082
30	2 42.632	2 52.488	3 02.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	31 .085
31	2 42.796	2 52.653	3 02.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	32 .088
32	2 42.960	2 52.817	3 02.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	33 .090
33	2 43.125	2 52.981	3 02.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	34 .093
34	2 43.289	2 53.145	3 03.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	35 .096
35	2 43.453	2 53.310	3 03.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	36 .099
36	2 43.617	2 53.474	3 03.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	37 .101
37	2 43.782	2 53.638	3 03.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	38 .104
38	2 43.946	2 53.803	3 03.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	39 .107
39	2 44.110	2 53.967	3 03.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	40 .110
40	2 44.275	2 54.131	3 03.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	41 .112
41	2 44.439	2 54.295	3 04.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	42 .115
42	2 44.603	2 54.460	3 04.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	43 .118
43	2 44.767	2 54.624	3 04.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	44 .120
44	2 44.932	2 54.788	3 04.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	45 .123
45	2 45.096	2 54.952	3 04.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	46 .126
46	2 45.260	2 55.117	3 04.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	47 .129
47	2 45.425	2 55.281	3 05.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	48 .131
48	2 45.589	2 55.445	3 05.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	49 .134
49	2 45.753	2 55.610	3 05.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	50 .137
50	2 45.917	2 55.774	3 05.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	51 .140
51	2 46.082	2 55.938	3 05.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	52 .142
52	2 46.246	2 56.102	3 05.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	53 .145
53	2 46.410	2 56.267	3 06.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	54 .148
54	2 46.574	2 56.431	3 06.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	55 .151
55	2 46.739	2 56.595	3 06.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	56 .153
56	2 46.903	2 56.759	3 06.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	57 .156
57	2 47.067	2 56.924	3 06.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	58 .159
58	2 47.232	2 57.088	3 06.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	59 .162
59	2 47.396	2 57.252	3 07.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	

TABLE. IV.

TABLE GIVING THE CORRECTION OF α URSÆ MINORIS AND δ URSÆ MINORIS
FOR TERMS OF NUTATION INVOLVING 2ϵ .

Δ or $\Delta - 180^\circ$.	α Ursæ Minoris.		δ Ursæ Minoris.		Δ or $\Delta - 180^\circ$.	Δ or $\Delta - 180^\circ$.	α Ursæ Minoris.		δ Ursæ Minoris.		Δ or $\Delta - 180^\circ$.
	R.A.	Dec.	R.A.	Dec.			R.A.	Dec.	R.A.	Dec.	
0	—229 ^s	+03 ^m	—008 ^s	—09 ^m	90	45	—075 ^s	—08 ^m	+078 ^s	—01 ^m	135
1	231	.02	.005	.09	91	46	.067	.08	.078	—01	136
2	233	.02	—003	.09	92	47	.058	.08	.079	.00	137
3	235	.02	.000	.09	93	48	.050	.08	.079	.00	138
4	236	.01	+003	.09	94	49	.042	.08	.078	.00	139
5	—238	+01	+006	—09	95	50	—034	—08	+078	+01	140
6	239	+01	.008	.09	96	51	.026	.08	.078	.01	141
7	240	.00	.011	.09	97	52	.017	.08	.077	.01	142
8	240	.00	.013	.09	98	53	—008	.08	.077	.02	143
9	240	.00	.016	.09	99	54	.000	.08	.077	.02	144
10	—240	.00	+019	—09	100	55	+008	—08	+076	+02	145
11	240	—01	.021	.09	101	56	.016	.08	.075	.03	146
12	239	.01	.024	.08	102	57	.025	.08	.074	.03	147
13	238	.01	.026	.08	103	58	.033	.08	.073	.03	148
14	236	.02	.029	.08	104	59	.042	.08	.072	.04	149
15	—235	—02	+032	—08	105	60	+050	—08	+071	+04	150
16	233	.02	.034	.08	106	61	.058	.08	.070	.04	151
17	231	.03	.037	.08	107	62	.066	.08	.069	.04	152
18	229	.03	.039	.08	108	63	.074	.08	.067	.05	153
19	226	.03	.042	.08	109	64	.082	.08	.066	.05	154
20	—223	—03	+044	—07	110	65	+090	—07	+064	+05	155
21	220	.03	.046	.07	111	66	.097	.07	.062	.05	156
22	216	.04	.048	.07	112	67	.105	.07	.061	.06	157
23	212	.04	.050	.07	113	68	.113	.07	.060	.06	158
24	208	.04	.052	.07	114	69	.120	.07	.058	.06	159
25	—204	—04	+054	—06	115	70	+127	—07	+056	+06	160
26	200	.05	.055	.06	116	71	.134	.07	.054	.06	161
27	196	.05	.057	.06	117	72	.141	.07	.052	.07	162
28	190	.05	.059	.06	118	73	.148	.07	.050	.07	163
29	185	.05	.061	.06	119	74	.154	.06	.048	.07	164
30	—179	—05	+063	—05	120	75	+161	—06	+046	+07	165
31	173	.06	.064	.05	121	76	.167	.06	.045	.07	166
32	168	.06	.065	.05	122	77	.173	.06	.043	.08	167
33	162	.06	.067	.05	123	78	.178	.05	.040	.08	168
34	155	.06	.068	.04	124	79	.184	.05	.037	.08	169
35	—148	—06	+070	—04	125	80	+189	—05	+034	+08	170
36	141	.07	.071	.04	126	81	.194	.05	.031	.08	171
37	133	.07	.072	.03	127	82	.199	.04	.029	.08	172
38	126	.07	.073	.03	128	83	.204	.04	.026	.08	173
39	119	.07	.074	.03	129	84	.207	.04	.024	.09	174
40	—113	—07	+075	—02	130	85	+212	—04	+022	+09	175
41	106	.07	.076	.02	131	86	.216	.03	.020	.09	176
42	.099	.07	.077	.02	132	87	.220	.03	.017	.09	177
43	.092	.08	.077	.02	133	88	.223	.03	.013	.09	178
44	.084	.08	.078	.01	134	89	.226	.03	.011	.09	179
45	—075	—08	+078	—01	135	90	+229	—03	+008	+09	180

NOTE. — These corrections were omitted in the places of these Stars in the volumes of this Ephemeris for 1857, 1858, and 1859. They have been applied in this volume.

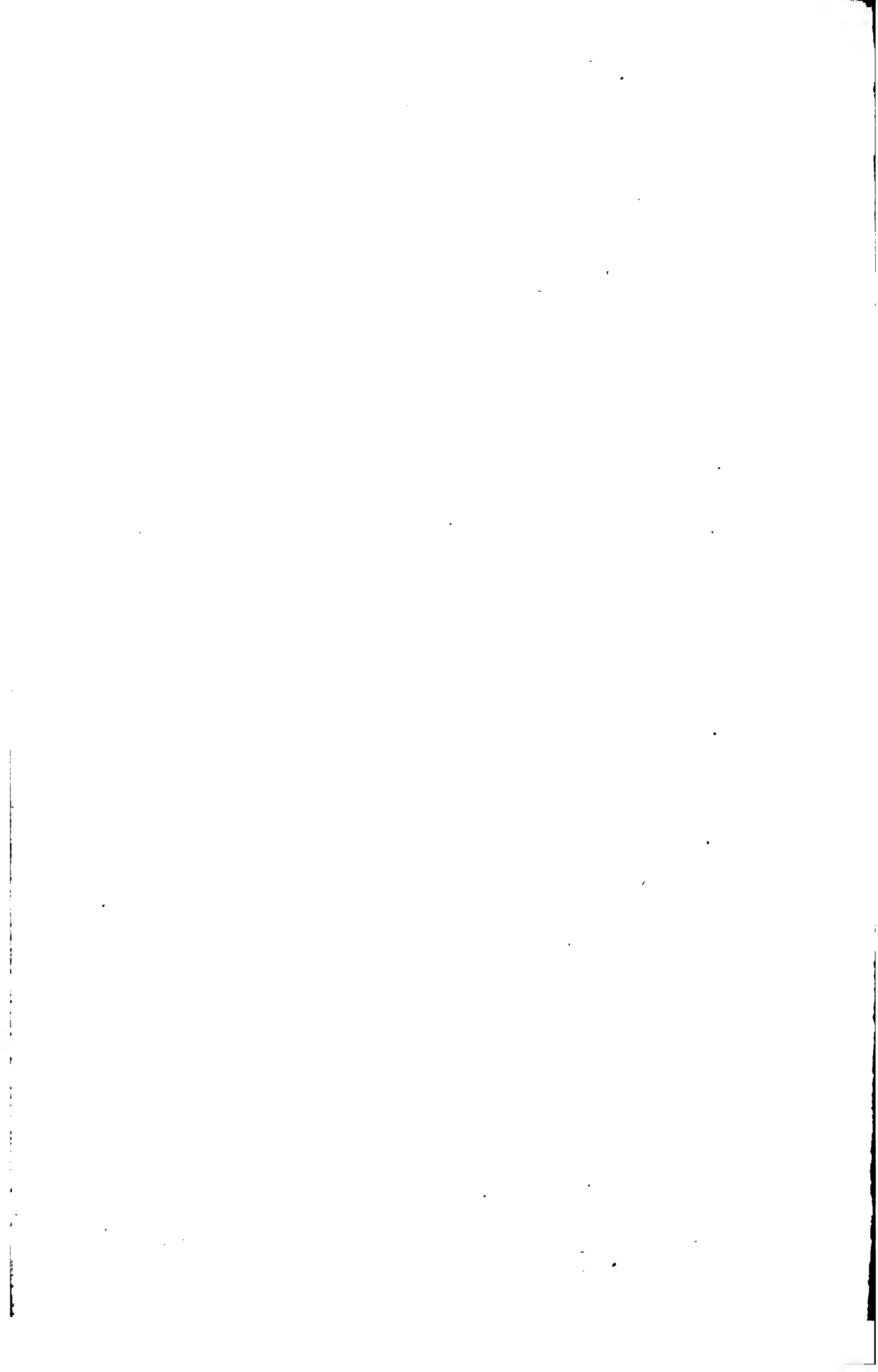


ASTEROIDS FOR THE YEAR 1859.

A SUPPLEMENT

TO THE

AMERICAN EPHEMERIS FOR 1861.



ASTEROIDS

FOR THE YEAR 1859.

THE ephemerides contained in the following pages were intended to accompany the volume of the *American Ephemeris* for the year 1860; but it has been thought expedient to publish them as a Supplement to the volume for the year 1861, in order that the earlier annual publication of the *Ephemeris* which is contemplated may not remove the portion devoted to the Asteroids in future volumes too far from the date for which it is prepared.

To facilitate the computation of Special Perturbations, the Heliocentric Coördinates of the principal planets have been referred to the mean equinox and ecliptic of Washington mean noon of the 2400,000th day of the Julian Period, which will be called in this *Ephemeris* the Asteroid Epoch, and, for convenience of printing, dates will be reckoned from it in mean solar days, which may easily be converted into days of the Julian Period by the addition of 2400,000. Elements of the Asteroids will be selected and reduced to this epoch, and those that seem sufficiently accurate — generally those that have satisfied observations at four oppositions — will remain unchanged until the computations become inconvenient in consequence of the magnitude of the perturbations. In the mean time, the effect of such small corrections of the elements as may seem necessary will be combined with the perturbations and applied to the coördinates. A change of the epoch will probably not be necessary within less than 5000 days. The computation of the perturbations of those of which the orbits are sufficiently well determined, and to which special methods must be applied, will be carried forward simultaneously. The effect of Jupiter and Saturn will be taken account of rigorously, that of the other planets will be neglected. In this way it is hoped that the *American Ephemeris* may contain annually approximate ephemerides of all or nearly all of the Asteroids. Corrected coördinates or accurate ephemerides at oppositions for comparison with observations will be published in some *Astronomical Journal*.

The table on pages 8–11 contains the elements which appear to be the best that have been computed up to this time. They are given for the dates for which they were originally computed, or the latest to which they have been reduced by the addition of perturbations, expressed in mean solar days, Washington time. In the next volume they will be reduced to the Asteroid Epoch (November 16, 1858). A small Table of Periodic Comets is appended, containing only those that have been observed at more than one appearance.

The following statement gives the authorities for the elements, and furnishes some idea of their accuracy. The comparisons with observations have not been very carefully made in all cases, but are sufficiently accurate to answer the purpose for which they are published here.

① *Ceres*. — *Astronomical Journal*, Vol. III. p. 165, by Mr. ERNEST SCHUBERT, from a thorough discussion of observations from 1832 to 1853, taking account of perturbations by Jupiter only. They have been reduced by him from 1854, January 0, to 1859, Septem-

ber 7, by applying the perturbations depending on Jupiter and Saturn. Comparison with observations at opposition in 1858 gave $\Delta a \cos \delta = -5''.2$, $\Delta \delta = +6''.2$.

(2) *Pallas*. — *English Nautical Almanac* for 1860, p. 572, by Mr. FARLEY, from eight oppositions, 1845 to 1853, inclusive, reduced, by addition of perturbations, depending on Venus, the Earth, Mars, Jupiter, and Saturn, to 1858, May 29, Greenwich. They nearly satisfy all the observations made at Greenwich near the times of oppositions as far as 1855 inclusive.

(3) *Juno*. — *English Nautical Almanac* for 1859, p. 564, from twelve oppositions, 1841 to 1855 inclusive, reduced by addition of perturbations depending on Venus, the Earth, Mars, Jupiter, and Saturn. Comparison with Greenwich observations at opposition in 1856 gave $\Delta a \cos \delta = -10''.7$, $\Delta \delta = +0''.7$, and at Königsberg in 1858,

$$\Delta a \cos \delta = -21''.0, \Delta \delta = +3''.0.$$

(4) *Vesta*. — *English Nautical Almanac* for the year 1860, p. 575, by Mr. FARLEY, from twelve oppositions, 1840 to 1855 inclusive, reduced by addition of perturbations depending on Venus, the Earth, Mars, Jupiter, and Saturn. They very nearly satisfy all the observations made at Greenwich near the times of oppositions as far as 1855 inclusive, and observations at Königsberg in 1858, within about 5".

(5) *Astræa*. — *Berliner Astron. Jahrbuch* for the year 1858, by Professor ZECH. They have satisfied observations at seven oppositions, from 1845 to 1853 inclusive, and at the opposition in 1856 gave, about, $\Delta a \cos \delta = +13''$, $\Delta \delta = +4''$.

(6) *Hebe*. — *Astronomische Nachrichten*, Vol. XXXI. p. 13, by R. LUTHER, from four oppositions, 1847–1850; in 1857 the errors at opposition were $\Delta a \cos \delta = +21''$, $\Delta \delta = -7''$.

(7) *Iris*. — *Astronomische Nachrichten*, Vol. XXVIII. p. 277, by Mr. ERNEST SCHUBERT, from two oppositions, 1847–1848, reduced by addition of perturbations.* They have agreed with observations since, until 1858, when the errors were

$$\Delta a \cos \delta = 46'', \Delta \delta = 15''.$$

(8) *Flora*. — *Tables of Flora*, by Professor F. BRÜNNOW, Berlin, 1855. They were computed from four oppositions, 1848–1852.

(9) *Metis*. — *Astronomische Nachrichten*, Vol. XXXVI. p. 71, by J. PH. WOLFERS, from six oppositions, 1848–1852. Have agreed with observations since; at opposition in 1857 the errors were $\Delta a \cos \delta = -11''$, $\Delta \delta = -1''$.

(10) *Hygea*. — *Astronomische Nachrichten*, Vol. XXXIX. p. 347, by Professor J. ZECH, from five oppositions, 1849–1854, reduced by addition of perturbations. At opposition in 1856 the errors were $\Delta a \cos \delta = -8''$, $\Delta \delta = +1''$.

(11) *Parthenope*. — *Astronomische Nachrichten*, Vol. XLI. p. 283, from four oppositions, 1850–1854. Errors in 1857, $\Delta a \cos \delta = -3''$, $\Delta \delta = -6''$.

(12) *Clio*. — *Astronomische Nachrichten*, Vol. XLV. p. 321, by Professor F. BRÜNNOW, from six oppositions, 1850–1856. Tables have been constructed by him.

(13) *Egeria*. — *Astronomical Journal*, Vol. II. p. 282, by Professor J. S. HUBBARD, 1850–1851. Tables have been constructed by Professor PEIRCE.

(14) *Irene*. — *Astronomische Nachrichten*, Vol. XLII. p. 141, from four oppositions, 1851–1855, by C. BRUHNS. At opposition in November, 1857, the errors were

$$\Delta a \cos \delta = -4'', \Delta \delta = -1''.$$

(15) *Eunomia*. — *Astronomical Journal*, Vol. IV. p. 170, by Mr. ERNEST SCHUBERT, from

* Perturbations by Jupiter and Saturn have been taken account of in all cases where it is not otherwise stated.

four oppositions, 1851–1854. Have agreed well with observations since. At opposition in 1858 the errors were $\Delta \alpha \cos \delta = +3''$, $\Delta \delta = -3''$.

⑩ *Psyche*. — Provisional elements selected, and reduced by Mr. SCHUBERT by addition of perturbations preparatory to a new determination of the orbit.

⑪ *Thetis*. — *Berliner Astron. Jahrbuch*, 1859, p. 419, by E. SCHÖNFELD, from four oppositions, 1852–1856. The errors at opposition in 1857 were $\Delta \alpha \cos \delta = -38''$, $\Delta \delta = -13''$.

⑫ *Melpomene*. — *Astronomical Journal*, Vol. V. p. 41, from four oppositions, 1852–1856. At opposition in 1858, $\Delta \alpha \cos \delta = +6''$, $\Delta \delta = -3''$.

⑬ *Fortuna*. — *Astronomische Nachrichten*, Vol. XLVI. p. 247, by C. POWALKY, from four oppositions, 1852–1856. Errors at opposition in 1858, $\Delta \alpha \cos \delta = -10''$, $\Delta \delta = +5''$.

⑭ *Massilia*. — *Astronomische Nachrichten*, Vol. XLV. p. 287, by W. GÜNTHER, from four oppositions, 1852–1856, perturbations by Jupiter alone being applied. In 1858,

$$\Delta \alpha \cos \delta = -11'', \Delta \delta = +1''.$$

⑮ *Lutetia*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 17, from four oppositions, perturbations by Jupiter alone being taken account of. Errors at opposition in 1858,

$$\Delta \alpha \cos \delta = +7'', \Delta \delta = +1''.$$

⑯ *Calliope*. — *Vienna Sitzungsberichte*, 1855, by Dr. C. HORNSTEIN, corrected by T. H. SAFFORD, Jr., so as to satisfy four oppositions, 1852–1856.

⑰ *Thalia*. — *Astronomical Journal*, Vol. V. p. 107, by ERNEST SCHUBERT, from four oppositions, 1853–1856. Errors at opposition in 1858, $\Delta \alpha \cos \delta = +4''$, $\Delta \delta = +1''$.

⑱ *Themis*. — *Astronomische Nachrichten*, Vol. XLVII. p. 161, by Dr. A. KRÜGER, from four oppositions, 1853–1856. At opposition in 1858, $\Delta \alpha \cos \delta = +2''$, $\Delta \delta = -1''$.

⑲ *Phocæa*. — *Astronomische Nachrichten*, Vol. XLVI. p. 129, by W. GÜNTHER, from three oppositions, 1853–1856. Errors in 1857, $\Delta \alpha \cos \delta = +19''$, $\Delta \delta = -7''$.

⑳ *Proserpina*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 171, by J. A. C. OUDEMANN, corrected by M. HOEK to satisfy four oppositions, 1853–1857. Errors at the opposition in 1858, $\Delta \alpha \cos \delta = +14''$, $\Delta \delta = -2''$.

㉑ *Euterpe*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 229, by W. GÜNTHER, from four oppositions, 1853–1858.

㉒ *Bellona*. — *Berliner Astron. Jahrbuch*, 1859, from two oppositions, 1854–1855. They have not been compared with observations since.

㉓ *Amphitrite*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 363, by W. GÜNTHER, from four oppositions, 1854–1858.

㉔ *Urania*. — *Astronomische Nachrichten*, Vol. XLVII. p. 21, by W. GÜNTHER, from three oppositions, 1854–1857.

㉕ *Euphrosyne*. — *Astronomische Nachrichten*, Vol. XLI. p. 289, by A. WINNECKE, from one opposition, 1854–1855. Errors at opposition in 1857 were $\Delta \alpha \cos \delta = +1''$, $\Delta \delta = +10''$.

㉖ *Pomona*. — Elements selected and reduced by Mr. ERNEST SCHUBERT, preparatory to a new determination of the orbit.

㉗ *Polyhymnia*. — Selected for correction by Mr. SCHUBERT.

㉘ *Circe*. — *Berliner Astron. Jahrbuch*, 1859, p. 420, from two oppositions, 1855–1856, by Dr. W. KLINKERFUES. At opposition in 1858, the errors were,

$$\Delta \alpha \cos \delta = -14' 3'', \Delta \delta = -3' 45''.$$

㉙ *Leucothea*. — Selected for correction by Mr. ERNEST SCHUBERT.

- ②② *Atalanta*. — *Berliner Astron. Jahrbuch*, 1860, p. 404, from two oppositions, by Dr. W. FÖRSTER, 1855 – 1857; agreed well with observation in 1858.
- ②7 *Fides*. — *Astronomische Nachrichten*, Vol. XLV. p. 17, from one opposition, by G. RÜMKE, 1855 – 1856; in 1857 they were in error about 20" in R. A. and 14" in Dec.
- ③③ *Leda*. — *Berliner Astron. Jahrbuch*, 1860, from one opposition, 1856, by M. LÖWY; agreed with observation in 1858 within about 2' in R. A. and 1' in Dec.
- ③9 *Laetitia*. — *Astronomische Nachrichten*, Vol. XLV. p. 379, from one opposition, 1856, by M. ALLÉ.
- ④④ *Harmonia*. — *Astronomische Nachrichten*, Vol. XLIV. p. 281, from one opposition, 1856, by C. POWALKY. Did not agree well with observation in 1857.
- ④① *Daphne*. — *Astronomische Nachrichten*, Vol. XLVII. p. 26, from five days' observations by C. F. PAPER, very uncertain.
- ④①* *Astronomical Journal*, Vol. V. p. 174, by Mr. ERNEST SCHUBERT, from observations in 1857.
- ④② *Isis*. — *Astronomische Nachrichten*, Vol. XLVI. p. 91, from observations in 1856. In December, 1857, the errors were $\Delta \alpha = -1'.7$, $\Delta \delta = -0'.6$.
- ④③ *Ariadne*. — *Astronomische Nachrichten*, Vol. XLIX. p. 39, by E. WEISS, from observations in 1857.
- ④④ *Nysa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 233, by M. GUSSEW, from observations in 1857.
- ④⑤ *Astronomische Nachrichten*, Vol. XLVIII. p. 359, by M. LÖWY, from observations in 1857.
- ④⑥ *Hestia*. — *Astronomical Journal*, Vol. V. p. 153, by J. C. WATSON.
- ④⑦ *Aglais*. — From observations in 1857, by T. H. SAFFORD, Jr. In February, 1858, the errors were $\Delta \alpha = +50''$, $\Delta \delta = +20''$.
- ④⑧ *Doris*. — *Astronomische Nachrichten*, Vol. XLVII. p. 319, by C. POWALKY.
- ④⑨ *Pales*. — *Astronomische Nachrichten*, Vol. XLVII. p. 315, by C. POWALKY.
- ⑤① *Verginia*. — *Astronomical Journal*, Vol. V. p. 118, by Mr. JAMES FERGUSON. They will probably give the place of the planet within 5'.
- ⑤① *Nemaisa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 124, from a few observations, by Dr. W. FÖRSTER.
- ⑤② *Europa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 221, by Dr. H. S. SCHULTZ. Approximate.
- ⑤③ *Calypso*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 335, by W. OELTZEN.
- ⑤④ *Astronomische Nachrichten*, Vol. XLIX. p. 185, by SCHJELLERUP.
- ⑤⑤ *Astronomical Journal*, Vol. V. p. 162, by T. H. SAFFORD, Jr. and S. NEWCOMB.

Oppositions. — PAGE 12 contains the dates of the oppositions for the years 1859 and 1860. Those that cannot be accurately determined are marked with two dots (:), or, when the date is very uncertain, the day of the month is omitted. Several oppositions have been unintentionally omitted from the list of 1860. They are, *Laetitia*, January 14; ⑤⑤, February 1; *Verginia*, April 14; *Harmonia*, June 29.

Ephemerides. — The approximate ephemerides on pages 13 – 29 are given for days of the

year corresponding to the days of the Julian Period for which the coördinates of the planets are given. They have been computed, in most cases, from the elements on pages 8-11, reduced, by the addition of perturbations by Jupiter and Saturn, to the date of the opposition nearest to the middle of the year 1859. The exceptions are Astræa, from elements in the *English Nautical Almanac* for 1861; Calliope, from HORNSTEIN'S Elements, without Mr. SAFFORD'S corrections; Amphitrite, from elements in *Astronomische Nachrichten*, Vol. XLV. p. 345; Urania, from elements in *Astronomische Nachrichten*, Vol. XLIII. p. 247; Egeria, from manuscript Tables by Professor PEIRCE; Flora, from BRÜNNOW'S Tables.

The ephemerides of Astræa and Egeria have been computed by Professor PEIRCE; Ceres, Iris, Eunomia, Melpomene, Thalia, Pomona, and Polyhymnia, by Mr. SAFFORD, using Mr. SCHUBERT'S elements and perturbations; Vesta, Metis, Massilia, Proserpina, Euterpe, Amphitrite, and Urania, by Professor A. W. SMITH; Pallas, Juno, Hebe, Hygea, Parthenope, Thetis, and Lutetia, by Professor J. M. VAN VLECK; Circe, Leda, and Isis, by Mr. G. SEARLE; Calliope, by Mr. W. FERREL; Flora and Fides, by Mr. F. W. BARDWELL; Irene, Fortuna, Aglaia, and Verginia, by Mr. SAFFORD.

Heliocentric Coördinates. — The Heliocentric Coördinates of Mars, Jupiter, and Saturn, referred to the Mean Equinox and Ecliptic of the Asteroid Epoch (November 16, 1858), are given on pages 30-34. They are intended to be used instead of the Equatorial Coördinates of the planets in *this Ephemeris*, for the years 1859 and 1860; for convenience, 2400,000 has been subtracted from the days of the Julian Period for which the coördinates are given.

The columns $-\frac{\kappa^2}{r^3}x$, $-\frac{\kappa^2}{r^3}y$, $-\frac{\kappa^2}{r^3}z$, contain the quantities $-1600m\frac{k^2}{r^3}x$, $-1600m\frac{k^2}{r^3}y$, $-1600m\frac{k^2}{r^3}z$, in which m is the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.23558$.

Symbol.	Name.	π .	Ω .	ϕ .	i .	μ .	L .
(1)	Ceres.	149 26 13.1	80 49 54.7	4 36 12.1	10 36 27.8	12 51.3333	346 48 15.4
(2)	Pallas.	122 7 38.4	172 38 32.7	13 50 57.1	34 42 29.8	12 49.4780	224 28 25.5
(3)	Juno.	54 0 55.8	170 58 22.0	14 50 35.7	13 3 9.8	13 33.8848	104 2 31.1
(4)	Vesta.	250 35 29.4	103 21 10.3	5 10 31.2	7 8 9.1	16 17.8432	218 26 1.1
(5)	Astræa.	134 35 35.7	141 24 48.5	10 57 8.3	5 19 35.2	14 17.9486	80 56 2.7
(6)	Hebe.	15 2 23.4	138 35 19.5	11 38 1.9	14 46 35.4	15 39.3481	124 54 18.6
(7)	Iris.	41 29 15.3	259 46 16.1	13 20 45.9	5 28 1.4	16 2.6335	322 34 38.8
(8)	Flora.	32 54 28.3	110 17 48.6	9 0 56.3	5 53 8.0	18 6.3310	68 48 32.0
(9)	Metis.	71 3 55.6	68 31 31.6	7 5 1.6	5 36 0.6	16 2.8856	128 8 12.7
(10)	Hygea.	227 47 58.8	287 38 34.2	5 46 16.6	3 47 9.3	10 34.8491	354 47 47.6
(11)	Parthenope.	316 10 7.1	125 3 41.1	5 40 30.3	4 36 57.9	15 23.7824	283 56 41.9
(12)	Clio.	301 39 24.7	235 34 41.7	12 38 44.1	8 23 19.4	16 35.8341	7 42 5.0
(13)	Egeria.	119 12 59.0	43 17 55.7	4 52 7.4	16 33 6.7	14 18.3861	138 44 42.6
(14)	Irene.	179 28 21.9	86 40 4.5	9 30 38.1	9 7 7.4	14 11.5608	67 12 20.6
(15)	Eunomia.	27 31 8.1	293 56 15.8	10 47 54.8	11 43 39.0	13 45.2220	238 54 5.1
(16)	Psyche.	13 16 14.8	150 35 34.0	7 42 49.7	3 4 6.5	11 50.0987	50 51 42.0
(17)	Thetis.	259 22 51.2	125 27 13.3	7 17 18.4	5 35 40.7	15 11.9760	210 1 24.3
(18)	Melpomene.	15 11 48.0	150 4 33.3	12 32 14.8	10 8 58.3	16 59.8395	304 33 25.3
(19)	Fortuna.	30 22 50.2	211 29 28.7	9 5 10.8	1 32 28.8	15 30.1578	148 28 55.8
(20)	Massilia.	98 28 37.6	206 41 27.6	8 15 42.3	0 41 7.3	15 48.7396	196 16 53.9
(21)	Lutetia.	327 2 45.2	80 27 23.3	9 19 32.1	3 5 11.1	15 33.5610	41 24 9.0
(22)	Calliope.	58 16 41.1	66 36 54.7	5 56 53.6	13 44 51.9	11 54.9070	76 59 2.0
(23)	Thalia.	123 58 40.6	67 38 34.4	13 23 56.7	10 13 13.6	13 52.4617	280 7 33.7
(24)	Themis.	137 54 9.7	36 10 30.3	6 44 53.0	0 49 1.8	10 34.6753	30 2 41.5
(25)	Phocæa.	302 46 9.0	214 4 54.6	14 37 38.8	21 35 53.6	15 53.6780	294 46 13.5
(26)	Proserpina.	235 17 26.8	45 53 14.6	5 1 15.7	3 35 40.3	13 39.6815	181 21 20.9
(27)	Euterpe.	87 39 0.0	93 44 45.0	9 57 22.5	1 35 31.1	16 26.6260	260 43 32.7
(28)	Bellona.	122 22 48.3	144 43 5.4	8 53 17.5	9 22 30.8	12 47.4862	159 3 36.8
(29)	Amphitrite.	56 39 6.6	356 26 51.8	4 9 3.1	6 7 49.6	14 28.8694	293 11 23.8
(30)	Urania.	31 23 24.7	308 13 46.3	7 18 22.7	2 5 56.9	16 16.0689	19 30 24.4
(31)	Euphrosyne.	93 51 6.6	31 25 23.0	12 28 29.8	26 25 12.4	10 32.8031	53 49 50.3
(32)	Pomona.	193 33 42.5	220 48 1.4	4 37 26.6	5 28 49.1	14 11.7238	134 30 20.0
(33)	Polyhymnia.	340 51 46.1	9 16 9.2	19 41 36.4	1 56 41.5	12 10.8833	266 47 55.8
(34)	Circe.	149 58 35.1	184 47 10.8	6 12 52.4	5 26 33.2	13 24.9883	193 36 37.2
(35)	Leucothea.	198 51 53.9	355 57 26.3	12 46 9.3	8 12 10.7	11 29.3084	173 36 11.3
(36)	Atalanta.	42 22 25.0	359 8 48.4	17 19 53.4	18 42 9.5	12 58.6000	36 19 53.2
(37)	Fides.	66 5 35.8	8 10 23.4	10 4 0.8	3 7 19.3	13 46.2860	42 34 30.3
(38)	Leda.	100 40 28.4	296 27 47.3	8 57 0.8	6 58 31.9	13 2.4484	112 55 7.2
(39)	Lætitia.	1 58 57.7	157 19 31.0	6 22 38.2	10 20 50.7	12 49.8940	146 44 19.7
(40)	Harmonia.	2 1 50.9	93 32 2.9	2 38 29.0	4 15 48.4	17 19.4100	222 12 9.1
(41)	Daphne.	230 21 29.8	180 5 50.8	11 40 57.0	15 48 23.0	15 54.1100	202 28 48.5
(41)*	.....	303 17 28.1	195 29 38.4	11 42 3.8	7 38 19.1	14 40.0100	335 48 51.5
(42)	Isis.	317 57 48.4	84 27 49.7	12 52 50.1	8 34 39.6	15 34.4490	276 45 1.9
(43)	Ariadne.	277 14 9.5	264 29 27.4	9 38 46.6	3 27 47.6	18 4.5177	224 5 10.4
(44)	Nysa.	111 46 12.3	130 54 33.4	8 25 51.6	3 41 56.6	15 36.4700	232 55 23.7
(45)	.....	235 4 34.4	147 51 37.7	4 54 10.7	6 35 59.1	13 5.1037	215 29 8.3

ASTEROIDS, 1859.

9

Symbol.	Period.	a.	e.	Epoch.	Date of Discovery.	By whom Discovered.
	a					
①	1680.207	2.765938	0.080257	1859, Sept. 7.0000	1801, Jan. 1	Piazzi, at Palermo.
②	1684.258	2.770386	0.239367	1858, May 28.7860	1802, Mar. 28	Harding, at Göttingen.
③	1592.365	2.668678	0.256176	1858, Jan. 28.7860	1804, Sept. 1	Olbers, at Bremen.
④	1325.366	2.361339	0.090204	1858, April 22.7860	1807, Mar. 29	Olbers, at Bremen.
⑤	1510.580	2.576500	0.189992	1849, Dec. 30.7488	1845, Dec. 8	Hencke, at Driessen.
⑥	1379.680	2.425418	0.201657	1857, Feb. 12.7488	1847, July 1	Hencke, at Driessen.
⑦	1346.307	2.396147	0.230832	1858, July 18.7488	1847, Aug. 13	Hind, at London.
⑧	1193.007	2.201386	0.156704	1848, Jan. 0.7488	1847, Oct. 18	Hind, at London.
⑨	1345.354	2.385730	0.123321	1858, June 29.7488	1848, April 25	Graham, at Markree.
⑩	2041.430	3.149373	0.100557	1851, Sept. 16.7488	1849, April 12	De Gasparis, at Naples.
⑪	1402.928	2.452588	0.098887	1858, June 26.7488	1850, May 13	De Gasparis, at Naples.
⑫	1301.423	2.332811	0.218920	1850, Dec. 30.7488	1850, Sept. 13	Hind, at London.
⑬	1509.810	2.575625	0.084873	1851, Dec. 5.0000	1850, Nov. 2	De Gasparis, at Naples.
⑭	1521.912	2.589368	0.165230	1857, Nov. 19.7488	1851, May 20	Hind, at London.
⑮	1570.486	2.644180	0.187357	1859, May 11.0000	1851, July 20	De Gasparis, at Naples.
⑯	1825.008	2.922752	0.134225	1860, Nov. 20.0000	1852, Mar. 17	De Gasparis, at Naples.
⑰	1421.090	2.473710	0.126865	1856, April 3.7488	1852, April 17	Luther, at Bilk.
⑱	1270.788	2.296060	0.217078	1859, July 2.0000	1852, June 24	Hind, at London.
⑲	1393.312	2.441368	0.157922	1858, Mar. 2.7488	1852, Aug. 22	Hind, at London.
⑳	1366.023	2.409386	0.143686	1858, April 20.7488	1852, Sept. 19	Chacornac, at Marseilles.
㉑	1388.232	2.435431	0.162045	1853, Jan. 1.7488	1852, Nov. 15	Goldschmidt, at Paris.
㉒	1439.977	2.495579	0.103630	1852, Dec. 30.7488	1852, Nov. 16	Hind, at London.
㉓	1556.829	2.628824	0.231732	1859, July 10.0000	1852, Dec. 15	Hind, at London.
㉔	2041.980	3.149947	0.117504	1856, Sept. 24.7488	1853, April 5	De Gasparis, at Naples.
㉕	1358.949	2.401060	0.252533	1857, July 9.7488	1853, April 6	Chacornac, at Marseilles.
㉖	1581.102	2.656079	0.087521	1857, Mar. 19.7488	1853, May 5	Luther, at Bilk.
㉗	1313.568	2.347305	0.172896	1859, June 13.7488	1853, Nov. 8	Hind, at London.
㉘	1688.630	2.775177	0.154507	1854, Feb. 27.7488	1854, May 1	Luther, at Bilk.
㉙	1491.594	2.554866	0.072383	1859, July 8.7488	1854, Mar. 1	Luther, at Bilk.
㉚	1327.805	2.364199	0.137174	1858, Oct. 8.7488	1854, July 22	Hind, at London.
㉛	2048.030	3.156158	0.216013	1854, Dec. 30.7488	1854, Sept. 1	Ferguson, at Washington
㉜	1521.620	2.589039	0.080617	1860, Jan. 24.7488	1854, Oct. 26	Goldschmidt, at Paris.
㉝	1773.197	2.867075	0.336987	1858, April 13.7488	1854, Oct. 28	Chacornac, at Paris.
㉞	1609.961	2.688302	0.108253	1855, April 9.4488	1855, April 15	Chacornac, at Paris.
㉟	1880.145	2.981229	0.221025	1860, Feb. 14.0000	1855, April 19	Luther, at Bilk.
㊱	1664.526	2.748705	0.297900	1855, Dec. 30.7488	1855, Oct. 5	Goldschmidt, at Paris.
㊲	1568.465	2.641907	0.174798	1855, Dec. 30.7488	1855, Oct. 5	Luther, at Bilk.
㊳	1636.339	2.739685	0.155576	1855, Dec. 30.7488	1856, Jan. 12	Chacornac, at Paris.
㊴	1633.349	2.769387	0.111075	1855, Dec. 31.7488	1856, Feb. 8	Chacornac, at Paris.
㊵	1246.861	2.267148	0.046085	1856, June 30.7488	1856, Mar. 31	Goldschmidt, at Paris.
㊶	1358.334	2.400337	0.202488	1856, May 31.2488	1856, May 23	Goldschmidt, at Paris.
㊷	1472.710	2.533257	0.202805	1857, Sept. 16.2844	1857, Sept. 9	Goldschmidt, at Paris.
㊸	1386.913	2.433889	0.222020	1856, June 30.7488	1856, May 23	Pogson, at Oxford.
㊹	1195.001	2.203838	0.167565	1857, April 16.7488	1857, April 15	Pogson, at Oxford.
㊺	1383.921	2.430386	0.146618	1857, July 9.7488	1857, May 27	Goldschmidt, at Paris.
㊻	1659.191	2.742828	0.085469	1856, Dec. 30.7488	1857, June 27	Goldschmidt, at Paris.

Symbol.	Name.	π .	Ω .	ϕ .	i .	μ .	L .
(46)	Hestia.	355° 4' 36.8	181° 26' 43.6	9° 45' 28.8	2° 17' 48.3	14' 36.5246	333° 1' 31.1
(47)	Aglaia.	314 16 26.4	4 29 19.6	7 21 42.5	5 0 24.7	12 5.8040	0 37 45.4
(48)	Doris.	77 11 47.7	185 13 30.9	4 25 19.8	6 29 44.0	10 47.9290	350 3 37.3
(49)	Pales.	32 49 23.3	290 27 1.0	13 44 54.4	3 8 25.0	10 54.4680	10 29 28.9
(50)	Verginia.	10 29 59.0	173 30 22.8	16 41 14.6	2 47 45.7	13 42.0410	12 5 7.9
(51)	Nemausa.	190 12 40.0	175 37 43.9	3 36 13.0	10 14 30.4	16 7.6380	179 47 1.8
(52)	Europa.	102 10 43.7	129 55 43.8	5 52 11.5	7 23 48.7	10 50.6371	147 35 49.8
(53)	Calypso.	94 38 52.3	143 30 27.8	10 23 3.6	5 3 38.8	14 0.0660	169 59 43.1
(54)	. . . . .	306 19 28.9	313 22 43.9	10 50 23.7	11 31 21.0	13 9.0790	329 25 3.3
(55)	. . . . .	21 47 23.8	10 51 28.2	7 41 19.4	7 36 47.4	12 46.0760	10 49 0.2

PERIODIC COMETS.

Name.	π .	Ω .	ϕ .	i .	μ .	L .
Halley's.	304° 32' 16.6	55° 10' 43.7	75° 19' 40.2	162° 14' 54.9	0' 46.5067	304° 32' 16.6
Encke's.	157 57 30.0	334 28 34.0	(57 57 30.3)	13 4 15.0	17 54.0500	157 59 18.0
Biela's I.	108 58 52.7	245 54 5.2	49 7 23.6	12 33 49.6	8 55.2767	108 58 52.7
Biela's II.	109 5 56.0	245 50 9.9	49 2 34.5	12 33 27.8	8 58.7065	109 5 56.0
Faye's.	49 49 4.6	209 45 23.4	33 42 43.4	11 21 36.7	7 55.1849	49 49 4.6
Brorsen's.	115 43 44.4	101 46 41.7	53 21 5.6	29 48 59.2	10 37.9355	115 43 44.4
Winnecke's.	275 59 53.0	113 0 53.1	47 35 5.2	10 42 43.4	11 48.0070	275 59 33.3
Tuttle's.	115 51 35.0	269 3 13.0	55 10 31.4	54 24 10.5	4 18.9576	116 10 44.5

ASTEROIDS, 1859.

11

Symbol.	Period.	a.	e.	Epoch.	Date of Discovery.	By whom Discovered.
	d					
(46)	1478.567	2.539968	0.169487	1857, Sept. 19.5000	1857, Aug. 16	Pogson, at Oxford.
(47)	1785.606	2.880435	0.128134	1857, Nov. 16.0000	1857, Sept. 15	Luther, at Bilk.
(48)	2000.219	3.106845	0.077105	1857, Oct. 30.7488	1857, Sept. 19	Goldschmidt, at Paris.
(49)	1980.234	3.086115	0.237660	1857, Oct. 30.7488	1857, Sept. 19	" "
(50)	1576.563	2.650994	0.287150	1857, Oct. 5.0000	1857, Oct. 4	Ferguson, at Washington.
(51)	1339.344	2.377912	0.062853	1858, Mar. 2.3400	1858, Jan. 22	Laurent, at Nismes.
(52)	1991.893	3.098218	0.102270	1858, Mar. 3.9052	1858, Feb. 4	Goldschmidt, at Paris.
(53)	1542.700	2.612894	0.180250	1858, April 27.2635	1858, April 4	Luther, at Bilk.
(54)	1642.436	2.724332	0.188066	1858, Sept. 25.1342	1858, Sept. 11	Goldschmidt, at Paris.
(55)	1691.750	2.778581	0.133791	1858, Sept. 27.3496	1858, Sept. 11	Searle, at Albany.

PERIODIC COMETS.

Period.	a.	e.	Epoch.	Perihelion Passage.
d				
27866.953	17.968470	0.967391	1835, Nov. 15.6941	1912.1
1206.648	2.218135	0.847663	1858, Oct. 18.2488	1862.1
2421.174	3.528733	0.756119	1852, Sept. 22.7316	1859.4
2405.760	3.513750	0.755201	1852, Sept. 23.4975	1859.4
2727.360	3.820286	0.555020	1858, Sept. 12.3908	1866.2
2031.554	3.139206	0.802313	1857, Mar. 29.0128	1862.8
1830.490	2.928505	0.738276	1858, May 2.2488	1863.3
5004.680	5.726007	0.820904	1858, Feb. 27.7488	1871.9

OPPOSITIONS.

1859.

Jan.	1	(41)*.
	4	(12) Clio.
Feb.	9	(40) Harmonia.
	17	(24) Circe.
	19	(50) Verginia.
	25	(42) Isis.
March	14	(5) Astræa.
	19	(22) Calliope.
	24	(14) Irene.
April	16	(24) Themis.
	26	(3) Juno.
	27	(9) Metis.
	27	(28) Bellona.
May	10	(15) Eunomia.
	15	(8) Flora.
	15:	(52) Europa.
June	3	(19) Fortuna.
	12:	(23) Calypso.
	13	(27) Euterpe.
July	1	(18) Melpomene.
	2	(28) Atalanta.
	9	(29) Amphitrite.
	10	(25) Thalia.
	10	(21) Lutetia.
	23	(16) Psyche.
Aug.	1	(20) Massilia.
	9:	(51) Nemausa.
	10	(2) Pallas.
	20	(27) Fides.
	26	(31) Euphrosyne.
Sept.	6	(1) Ceres.
Oct.	4	(4) Vesta.
	15	(6) Hebe.
Nov.	4	(26) Proserpina.
	7	(38) Leda.
	26	(23) Polyhymnia.
Dec.	1	(11) Parthenope.
	:	(54)
	16:	(45).

1860.

Jan.	6	(44) Nysa.
	26	(22) Pomona.
	30	(13) Egeria.
Feb.	10	(7) Iris.
	29	(48) Doris.
March	1	(43) Ariadne.
	1	(27) Aglaia.
	6	(25) Leucothea.
	10	(10) Hygea.
	10	(26) Phocæa.
	11	(50) Urania.
	20:	(41)*.
	24:	(48) Pales.
	30:	(46) Hestia.
April	9	(12) Clio.
	26	(17) Thetis.
June	1	(22) Calliope.
	20	(24) Circe.
July	1	(3) Juno.
	2	(24) Themis.
	6	(42) Isis.
	10	(5) Astræa.
	19	(28) Bellona.
	:	(52) Europa.
Aug.	7	(14) Irene.
	13	(9) Metis.
	20	(15) Eunomia.
Sept.	:	(53) Calypso.
	28	(24) Thalia.
Oct.	6	(27) Euterpe.
	9	(2) Pallas.
Nov.	7	(19) Fortuna.
	13	(29) Amphitrite.
	13	(8) Flora.
	19	(31) Euphrosyne.
	23	(16) Psyche.
Dec.	:	(51) Nemausa.
	7	(1) Ceres.
	21	(20) Massilia.
	25	(21) Lutetia.

WASHINGTON MEAN NOON.

① CERES.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	^h ^m	^m	[°] [']	[']	
Jan. -5	19 35.6	+1.73	26 28.9	+2.80	0.5882
+5	19 52.8	1.73	25 58.2	2.80	0.5922
15	20 10.1	1.73	25 21.1	2.97	0.5947
25	20 27.2	1.69	24 38.8	4.46	0.5954
Feb. 4	20 44.0	1.67	23 51.8	4.69	0.5945
14	21 0.6	1.64	23 1.0	5.22	0.5919
24	21 16.9	1.60	22 7.2	5.47	0.5875
Mar. 6	21 32.7	1.56	21 11.5	5.61	0.5818
16	21 48.0	1.51	20 14.9	5.64	0.5742
26	22 2.9	1.46	19 18.5	5.87	0.5554
April 5	22 17.3	1.40	18 23.4	5.97	0.5543
15	22 30.9	1.33	17 31.1	5.92	0.5415
25	22 43.8	1.26	16 43.0	4.66	0.5272
May 5	22 56.1	1.18	16 0.1	4.01	0.5124
15	23 7.4	1.08	15 22.8	3.34	0.4952
25	23 17.7	0.98	14 53.3	2.44	0.4769
June 4	23 27.0	0.86	14 34.0	1.87	0.4572
14	23 34.9	0.73	14 25.9	+0.19	0.4364
24	23 41.4	0.58	14 30.1	-1.09	0.4149
July 4	23 46.1	0.38	14 47.7	2.46	0.3996
14	23 49.0	+0.18	15 19.4	3.94	0.3714
24	23 49.7	-0.04	16 4.5	5.63	0.3510
Aug. 3	23 48.1	0.27	17 1.8	6.18	0.3326
13	23 44.3	0.48	18 7.2	6.70	0.3174
23	23 38.5	0.66	19 15.9	6.73	0.3066
Sept. 2	23 31.0	0.79	20 21.6	6.07	0.3011
12	23 22.7	0.88	21 17.4	4.78	0.3008
22	23 14.4	0.79	21 56.5	2.97	0.3068
Oct. 2	23 6.9	0.66	22 14.9	-0.77	0.3185
12	23 1.1	0.46	22 11.9	+1.28	0.3346
22	22 57.6	0.24	21 49.2	3.04	0.3541
Nov. 1	22 56.2	-0.02	21 11.0	4.58	0.3751
11	22 57.2	+0.20	20 18.6	5.81	0.3971
21	23 0.3	0.40	19 14.7	6.88	0.4192
Dec. 1	23 5.2	0.69	18 0.9	7.75	0.4410
11	23 12.1	0.78	16 39.6	8.41	0.4617
21	23 20.3	0.87	15 12.7	8.92	0.4820
31	23 29.6	+0.98	-13 41.2	+9.30	0.4987

② PALLAS.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	^h ^m	^m	[°] [']	[']	
Jan. -5	18 44.5	+1.38	2 31.3	-0.28	0.6248
+5	18 58.4	1.38	2 33.7	+0.73	0.6270
15	19 12.2	1.37	2 45.9	1.08	0.6277
25	19 25.8	1.24	3 7.3	2.86	0.6268
Feb. 4	19 39.0	1.30	3 37.2	3.38	0.6244
14	19 51.8	1.25	4 15.0	4.14	0.6204
24	20 4.1	1.30	5 0.0	4.81	0.6149
Mar. 6	20 15.9	1.14	5 51.3	5.90	0.6078
16	20 27.0	1.07	6 47.9	6.88	0.5992
26	20 37.3	0.98	7 48.9	6.38	0.5891
April 5	20 46.7	0.89	8 53.1	6.37	0.5775
15	20 55.1	0.78	9 59.4	6.66	0.5645
25	21 2.4	0.66	11 6.3	6.64	0.5502
May 5	21 8.4	0.53	12 12.2	6.44	0.5346
15	21 13.1	0.38	13 15.2	6.04	0.5180
25	21 16.1	0.21	14 13.1	5.40	0.5007
June 4	21 17.4	+0.04	15 3.2	4.46	0.4829
14	21 16.9	-0.14	15 42.3	3.19	0.4651
24	21 14.6	0.22	16 7.1	+1.87	0.4479
July 4	21 10.5	0.49	16 13.8	-0.40	0.4321
14	21 4.7	0.64	15 59.1	2.86	0.4184
24	20 57.7	0.72	15 20.7	5.06	0.4077
Aug. 3	20 50.0	0.77	14 17.9	7.41	0.4008
13	20 42.3	0.74	12 52.5	9.45	0.3983
23	20 35.1	0.66	11 8.8	10.99	0.4003
Sept. 2	20 29.2	0.50	9 12.7	11.99	0.4070
12	20 25.0	0.32	7 10.8	12.15	0.4177
22	20 22.7	-0.12	5 9.6	11.81	0.4316
Oct. 2	20 22.5	+0.08	3 14.5	11.01	0.4479
12	20 24.3	0.27	+1 29.4	9.89	0.4657
22	20 28.0	0.45	-0 3.4	8.80	0.4843
Nov. 1	20 33.4	0.61	1 22.6	7.21	0.5028
11	20 40.3	0.76	2 27.7	5.81	0.5209
21	20 48.5	0.88	3 18.9	4.45	0.5381
Dec. 1	20 57.9	0.98	3 56.8	3.17	0.5541
11	21 8.2	1.06	4 22.3	1.97	0.5686
21	21 19.2	1.14	4 36.2	-0.66	0.5816
31	21 31.0	+1.21	-4 39.5	+0.16	0.5929

WASHINGTON MEAN NOON.

② JUNO.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	14 14.8	+1.06	- 7 46.6	-2.68	0.5460
+5	14 25.1	0.98	8 7.5	1.00	0.5311
15	14 34.4	0.96	8 18.6	-0.66	0.5147
25	14 42.4	0.78	8 19.1	+0.60	0.4969
Feb. 4	14 49.0	0.58	8 8.6	1.62	0.4780
14	14 54.0	0.40	7 46.5	2.79	0.4583
24	14 57.0	+0.20	7 12.7	2.94	0.4385
Mar. 6	14 58.0	0.00	6 27.6	6.62	0.4191
16	14 56.9	-0.22	5 32.1	6.96	0.4012
26	14 53.6	0.42	4 28.4	6.68	0.3858
April 5	14 48.4	0.60	3 19.4	6.84	0.3738
15	14 41.6	0.72	2 9.4	6.90	0.3665
25	14 33.9	0.78	1 3.4	6.16	0.3643
May 5	14 26.0	0.77	- 0 6.3	6.07	0.3675
15	14 18.5	0.69	+ 0 38.0	3.06	0.3760
25	14 12.1	0.56	1 7.0	2.10	0.3888
June 4	14 7.2	0.39	1 20.0	+0.63	0.4062
14	14 4.2	0.20	1 17.6	-0.22	0.4239
24	14 3.1	-0.02	1 1.4	2.21	0.4440
July 4	14 3.8	+0.16	+ 0 33.3	2.20	0.4646
14	14 6.4	0.32	- 0 4.5	4.16	0.4852
24	14 10.5	0.48	0 49.2	4.08	0.5051
Aug. 3	14 16.0	0.62	1 42.2	5.22	0.5241
13	14 22.9	0.74	2 36.6	6.62	0.5419
23	14 30.8	0.84	3 34.8	6.89	0.5583
Sept. 2	14 39.8	0.94	4 34.4	6.97	0.5732
12	14 49.7	1.02	5 34.3	6.96	0.5865
22	15 0.3	1.10	6 33.5	6.62	0.5982
Oct. 2	15 11.7	1.16	7 31.0	6.02	0.6082
12	15 23.6	1.22	8 25.9	5.22	0.6165
22	15 36.1	1.27	9 17.4	4.94	0.6231
Nov. 1	15 49.0	1.31	10 4.8	4.60	0.6280
11	16 2.3	1.34	10 47.4	3.98	0.6312
21	16 15.8	1.36	11 24.4	3.40	0.6326
Dec. 1	16 29.6	1.38	11 55.5	2.78	0.6323
11	16 43.5	1.39	12 20.1	2.12	0.6302
21	16 57.5	1.39	12 37.9	1.42	0.6264
31	17 11.4	+1.38	-12 48.6	-0.08	0.6207

④ VESTA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	19 12.8	+2.22	-23 9.6	+2.34	0.4978
+5	19 35.7	2.27	22 39.9	2.26	0.5015
15	19 58.3	2.24	21 58.5	4.08	0.5039
25	20 20.6	2.21	21 6.3	6.09	0.5050
Feb. 4	20 42.5	2.16	20 4.6	6.88	0.5047
14	21 3.9	2.11	18 54.6	7.34	0.5031
24	21 24.8	2.06	17 37.8	7.96	0.5002
Mar. 6	21 45.2	2.01	16 15.5	8.42	0.4960
16	22 5.0	1.96	14 49.3	8.75	0.4904
26	22 24.2	1.89	13 20.5	8.94	0.4834
April 5	22 42.9	1.82	11 50.5	8.98	0.4750
15	23 0.9	1.77	10 20.9	8.87	0.4652
25	23 18.4	1.71	8 53.0	8.64	0.4539
May 5	23 35.2	1.64	7 28.1	8.26	0.4412
15	23 51.3	1.57	6 7.2	7.72	0.4270
25	0 6.7	1.49	4 53.7	7.07	0.4112
June 4	0 21.2	1.40	3 46.5	6.27	0.3939
14	0 34.8	1.30	2 48.3	5.21	0.3751
24	0 47.3	1.19	2 0.2	4.22	0.3548
July 4	0 58.6	1.05	1 23.7	3.20	0.3330
14	1 8.3	0.88	1 0.4	1.61	0.3101
24	1 16.3	0.69	0 51.5	+0.10	0.2861
Aug. 3	1 22.1	0.46	0 58.4	-1.60	0.2618
13	1 25.6	+0.21	1 21.5	2.13	0.2376
23	1 26.3	-0.07	2 0.7	4.05	0.2148
Sept. 2	1 24.3	0.24	2 54.6	4.21	0.1947
12	1 19.5	0.00	3 59.0	6.67	0.1789
22	1 12.2	0.20	5 8.0	6.77	0.1692
Oct. 2	1 3.4	0.91	6 14.5	5.26	0.1666
12	0 54.0	0.91	7 7.3	4.41	0.1719
22	0 45.2	0.79	7 42.7	2.42	0.1847
Nov. 1	0 38.1	0.59	7 56.0	-0.20	0.2038
11	0 33.4	0.24	7 46.8	+1.95	0.2276
21	0 31.3	-0.07	7 17.0	2.86	0.2542
Dec. 1	0 31.9	+0.18	6 29.5	6.48	0.2822
11	0 35.0	0.42	5 27.3	6.78	0.3107
21	0 40.3	0.62	4 13.8	7.80	0.3385
31	0 47.5	+0.80	- 2 51.2	+8.61	0.3652

WASHINGTON MEAN NOON.

⑤ ASTRÆA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 11 48.1	m +1.14	° ' " + 2 11.3	' " " -4.30	0.2349
+5	11 58.3	0.00	1 35.8	3.02	0.2070
15	12 6.1	0.08	1 18.8	-0.04	0.1788
25	12 11.6	0.20	1 22.8	+1.03	0.1509
Feb. 4	12 14.0	+0.08	1 49.4	3.77	0.1248
14	12 13.2	-0.23	2 38.2	5.04	0.1022
24	12 9.5	0.50	3 46.2	7.43	0.0850
Mar. 6	12 3.3	0.00	5 6.9	8.20	0.0752
16	11 55.7	0.77	6 30.3	7.02	0.0743
26	11 47.9	0.73	7 45.3	6.06	0.0626
April 5	11 41.2	0.57	8 43.6	4.08	0.0693
15	11 36.5	0.33	9 18.9	3.24	0.1227
25	11 34.5	-0.07	9 30.4	+0.02	0.1506
May 5	11 35.2	+0.20	9 19.4	-2.00	0.1812
15	11 38.5	0.45	8 48.7	3.90	0.2129
25	11 44.1	0.66	8 1.4	5.39	0.2446
June 4	11 51.6	0.84	7 0.8	6.00	0.2757
14	12 0.8	0.99	5 49.4	7.58	0.3055
24	12 11.4	1.11	4 29.2	8.36	0.3338
July 4	12 23.0	1.21	3 2.2	8.08	0.3606
14	12 35.6	1.30	+ 1 30.2	9.36	0.3856
24	12 40.0	1.38	- 0 5.1	9.04	0.4089
Aug. 3	13 3.1	1.44	1 42.6	9.79	0.4306
13	13 17.7	1.49	3 21.0	9.92	0.4506
23	13 32.8	1.54	4 59.1	9.74	0.4688
Sept. 2	13 48.4	1.58	6 35.9	9.07	0.4854
12	14 4.4	1.62	8 10.5	9.20	0.5004
22	14 20.8	1.66	9 41.8	8.98	0.5138
Oct. 2	14 37.5	1.69	11 9.2	8.49	0.5257
12	14 54.5	1.73	12 31.6	7.98	0.5359
22	15 11.8	1.74	13 48.4	7.36	0.5445
Nov. 1	15 29.3	1.76	14 58.9	6.70	0.5515
11	15 47.0	1.78	16 2.4	5.97	0.5570
21	16 4.8	1.79	16 58.3	5.20	0.5609
Dec. 1	16 22.7	1.78	17 46.4	4.39	0.5631
11	16 40.5	1.77	18 26.2	3.55	0.5636
21	16 58.2	1.76	18 57.4	2.71	0.5626
31	17 15.8	+1.73	-19 20.4	-1.01	0.5598

⑥ HEBE.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 18 36.2	m +2.02	° ' " -16 37.1	' " " - 0.08	0.5245
+5	18 56.6	2.08	16 38.7	+ 0.39	0.5221
15	19 17.2	2.06	16 29.3	1.46	0.5181
25	19 37.9	2.07	16 9.4	2.48	0.5127
Feb. 4	19 58.7	2.08	15 39.6	3.44	0.5059
14	20 19.5	2.07	15 0.6	4.32	0.4976
24	20 40.2	2.06	14 13.2	5.11	0.4878
Mar. 6	21 0.8	2.06	13 18.4	5.80	0.4765
16	21 21.2	2.03	12 17.3	6.38	0.4637
26	21 41.4	2.01	11 11.2	6.78	0.4495
April 5	22 1.5	2.00	10 1.6	7.07	0.4340
15	22 21.4	1.97	8 49.8	7.22	0.4169
25	22 41.0	1.95	7 37.1	7.16	0.3984
May 5	23 0.4	1.93	6 26.5	6.92	0.3785
15	23 19.6	1.90	5 18.6	6.53	0.3571
25	23 38.4	1.86	4 15.9	6.00	0.3343
June 4	23 56.8	1.82	3 20.6	5.44	0.3100
14	0 14.9	1.78	2 35.1	4.84	0.2842
24	0 32.5	1.73	2 1.8	4.29	0.2570
July 4	0 49.4	1.64	1 43.3	+ 0.06	0.2286
14	1 5.3	1.53	1 42.5	- 0.05	0.1987
24	1 20.0	1.39	2 2.3	2.14	0.1683
Aug. 3	1 33.2	1.22	2 45.3	2.55	0.1374
13	1 44.5	1.00	3 53.4	3.09	0.1065
23	1 53.3	0.74	5 27.2	10.08	0.0766
Sept. 2	1 59.3	0.44	7 25.1	12.72	0.0491
12	2 2.1	+0.10	9 41.6	14.10	0.0256
22	2 1.4	-0.23	12 7.0	14.36	0.0079
Oct. 2	1 57.5	0.50	14 26.8	12.84	9.9978
12	1 51.3	0.67	16 23.9	9.83	9.9965
22	1 44.0	0.71	17 43.8	5.09	0.0042
Nov. 1	1 37.0	0.61	18 17.8	- 1.04	0.0200
11	1 31.8	0.39	18 4.7	+ 3.38	0.0423
21	1 29.2	-0.11	17 10.2	7.13	0.0693
Dec. 1	1 20.6	+0.19	15 42.1	10.04	0.0983
11	1 33.1	0.48	13 49.3	12.18	0.1307
21	1 39.2	0.71	11 39.5	13.61	0.1623
31	1 47.3	+0.88	- 9 19.1	+14.29	0.1936

WASHINGTON MEAN NOON.

⑦ IRIS.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "	
Jan. -5	21 38.1	+2.00	- 9 31.4	+ 9.39	0.3980
+5	21 58.5	2.07	7 52.5	10.36	0.4083
15	22 19.4	2.10	6 4.1	11.26	0.4172
25	22 40.6	2.14	4 7.2	12.06	0.4250
Feb. 4	23 2.2	2.17	- 2 2.9	12.71	0.4317
14	23 24.1	2.20	+ 0 7.1	13.27	0.4372
24	23 46.3	2.24	2 21.4	13.55	0.4419
Mar. 6	0 8.9	2.27	4 38.2	13.71	0.4451
16	0 31.8	2.29	6 55.7	13.86	0.4487
26	0 54.7	2.31	9 11.9	13.98	0.4509
April 5	1 18.0	2.41	11 24.8	13.94	0.4519
15	1 42.9	2.47	13 32.8	13.98	0.4533
25	2 7.5	2.48	15 33.4	11.00	0.4536
May 5	2 32.5	2.52	17 24.8	10.69	0.4533
15	2 57.9	2.56	19 5.3	9.40	0.4525
25	3 23.7	2.59	20 32.9	8.08	0.4510
June 4	3 49.8	2.62	21 46.4	6.57	0.4490
14	4 16.1	2.63	22 44.4	4.99	0.4464
24	4 42.4	2.63	23 26.2	3.41	0.4431
July 4	5 8.7	2.61	23 51.3	+ 1.06	0.4392
14	5 34.7	2.58	23 59.4	- 0.06	0.4344
24	6 0.3	2.53	23 51.1	1.61	0.4289
Aug. 3	6 25.3	2.46	23 27.1	3.12	0.4224
13	6 49.6	2.38	22 48.5	4.68	0.4150
23	7 13.0	2.29	21 56.5	6.78	0.4065
Sept. 2	7 35.4	2.18	20 52.8	8.80	0.3968
12	7 56.7	2.07	19 39.3	7.06	0.3850
22	8 16.8	1.95	18 19.1	6.45	0.3736
Oct. 2	8 35.7	1.81	16 50.2	9.01	0.3597
12	8 53.1	1.66	15 18.8	9.22	0.3443
22	9 9.0	1.50	13 45.5	9.30	0.3273
Nov. 1	9 23.2	1.33	12 12.7	9.14	0.3086
11	9 35.6	1.13	10 42.6	8.74	0.2883
21	9 45.9	0.91	9 17.8	8.08	0.2666
Dec. 1	9 53.8	0.66	8 0.9	7.15	0.2437
11	9 58.9	0.37	6 54.7	5.84	0.2203
21	10 1.2	+0.06	6 2.1	4.42	0.1970
31	10 0.2	-0.26	+ 5 26.2	- 2.71	0.1753

⑧ FLORA.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "	
Jan. -5	14 41.9	+1.47	-10 29.6	-3.99	0.4768
+5	14 56.4	1.42	11 24.6	3.07	0.4603
15	15 10.3	1.34	12 11.0	4.20	0.4421
25	15 23.3	1.24	12 48.6	3.30	0.4219
Feb. 4	15 35.2	1.12	13 17.1	2.39	0.3998
14	15 45.7	0.97	13 36.5	1.49	0.3760
24	15 54.7	0.80	13 46.9	-0.60	0.3506
Mar. 6	16 1.7	0.66	13 48.6	+0.25	0.3239
16	16 6.4	0.54	13 41.9	1.03	0.2965
26	16 8.5	+0.06	13 27.5	1.73	0.2692
April 5	16 7.7	-0.22	13 6.3	2.39	0.2429
15	16 3.9	0.62	12 39.6	3.84	0.2190
25	15 57.3	0.77	12 9.4	2.07	0.1992
May 5	15 48.5	0.96	11 38.1	2.99	0.1854
15	15 38.1	1.09	11 9.6	2.53	0.1735
25	15 27.4	1.02	10 47.5	1.71	0.1794
June 4	15 17.7	0.87	10 35.4	+0.69	0.1877
14	15 9.9	0.65	10 36.6	-0.73	0.2024
24	15 4.6	0.39	10 49.0	1.98	0.2218
July 4	15 2.1	-0.10	11 15.2	2.19	0.2443
14	15 2.6	+0.18	11 52.8	4.22	0.2684
24	15 5.7	0.43	12 39.8	6.06	0.2930
Aug. 3	15 11.2	0.66	13 34.1	8.69	0.3173
13	15 18.9	0.87	14 33.6	11.11	0.3407
23	15 28.6	1.06	15 36.3	13.38	0.3628
Sept. 2	15 40.1	1.22	16 40.3	15.26	0.3834
12	15 53.1	1.37	17 43.9	17.26	0.4023
22	16 7.5	1.60	18 45.5	19.97	0.4196
Oct. 2	16 23.2	1.62	19 43.4	22.84	0.4352
12	16 40.0	1.73	20 36.3	25.97	0.4490
22	16 57.8	1.88	21 22.8	28.27	0.4612
Nov. 1	17 16.6	1.92	22 1.7	30.45	0.4717
11	17 36.2	1.99	22 31.8	32.82	0.4805
21	17 56.5	2.06	22 52.1	35.30	0.4877
Dec. 1	18 17.5	2.12	23 1.8	-0.41	0.4934
11	18 38.9	2.15	23 0.3	+0.73	0.4975
21	19 0.6	2.19	22 47.1	1.91	0.5000
31	19 22.7	+2.22	-22 22.1	+2.12	0.5011

WASHINGTON MEAN NOON.

⑨ METIS.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 13 58.4	m +1.34	° - 7 26.7	' -6.84	0.4395
+5	14 11.4	1.24	8 30.9	5.97	0.4215
15	14 23.3	1.13	9 26.1	5.04	0.4017
25	14 33.8	0.97	10 11.7	4.08	0.3803
Feb. 4	14 42.8	0.80	10 47.3	3.04	0.3574
14	14 49.9	0.59	11 12.6	2.06	0.3334
24	14 54.7	0.35	11 27.4	-0.96	0.3087
Mar. 6	14 57.0	+0.09	11 31.6	+0.10	0.2842
16	14 56.6	-0.18	11 25.4	1.11	0.2608
26	14 53.3	0.47	11 9.4	2.01	0.2399
April 5	14 47.2	0.71	10 45.1	2.71	0.2231
15	14 39.0	0.89	10 15.1	3.11	0.2119
25	14 29.4	0.97	9 42.9	3.10	0.2075
May 5	14 19.5	0.95	9 13.1	2.68	0.2106
15	14 10.4	0.83	8 50.3	1.75	0.2208
25	14 2.9	0.63	8 38.1	+0.59	0.2370
June 4	13 57.8	0.38	8 38.4	-0.69	0.2579
14	13 55.2	-0.13	8 52.0	1.98	0.2817
24	13 55.2	+0.11	9 18.1	3.17	0.3072
July 4	13 57.5	0.25	9 55.4	4.20	0.3331
14	14 2.1	0.55	10 42.1	5.05	0.3588
24	14 8.6	0.73	11 36.4	5.73	0.3836
Aug. 3	14 16.8	0.89	12 36.7	6.24	0.4072
13	14 26.4	1.03	13 41.2	6.59	0.4293
23	14 37.4	1.15	14 48.5	6.80	0.4498
Sept. 2	14 49.5	1.25	15 57.2	6.98	0.4686
12	15 2.7	1.35	17 5.8	6.79	0.4857
22	15 16.8	1.45	18 13.1	6.63	0.5011
Oct. 2	15 31.8	1.53	19 18.2	6.35	0.5147
12	15 47.5	1.60	20 20.1	5.97	0.5266
22	16 3.9	1.67	21 17.6	5.49	0.5367
Nov. 1	16 20.9	1.73	22 9.9	4.92	0.5452
11	16 38.4	1.77	22 56.1	4.28	0.5519
21	16 56.4	1.83	23 35.5	3.67	0.5570
Dec. 1	17 14.8	1.85	24 7.6	2.82	0.5604
11	17 33.4	1.87	24 31.9	2.03	0.5620
21	17 52.3	1.89	24 48.0	1.20	0.5620
31	18 11.2	+1.90	24 56.0	-0.83	0.5603

⑩ HYGEA.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 6 19.9	m -0.88	° +24 30.7	' -0.42	0.3790
+5	6 11.1	0.84	24 25.1	0.68	0.3808
15	6 3.1	0.72	24 17.1	0.68	0.3879
25	5 56.7	0.53	24 7.5	0.68	0.3996
Feb. 4	5 52.4	0.21	23 57.5	0.96	0.4150
14	5 50.4	-0.68	23 48.2	0.87	0.4328
24	5 50.8	+0.15	23 40.0	0.77	0.4520
Mar. 6	5 53.5	0.37	23 32.8	0.68	0.4717
16	5 58.2	0.55	23 26.2	0.66	0.4913
26	6 4.7	0.73	23 19.5	0.71	0.5102
April 5	6 12.8	0.87	23 12.0	0.84	0.5279
15	6 22.2	1.00	23 2.6	1.07	0.5444
25	6 32.9	1.11	22 50.5	1.38	0.5595
May 5	6 44.5	1.19	22 35.0	1.75	0.5731
15	6 56.8	1.26	22 15.4	2.19	0.5851
25	7 9.8	1.32	21 51.2	2.66	0.5955
June 4	7 23.3	1.37	21 22.1	3.17	0.6043
14	7 37.2	1.40	20 47.8	3.69	0.6116
24	7 51.3	1.43	20 8.2	4.23	0.6173
July 4	8 5.6	1.43	19 23.3	4.75	0.6214
14	8 20.0	1.44	18 33.1	5.27	0.6240
24	8 34.5	1.44	17 37.9	5.76	0.6251
Aug. 3	8 48.9	1.43	16 37.9	6.22	0.6246
13	9 3.2	1.43	15 33.4	6.65	0.6225
23	9 17.4	1.41	14 24.9	7.03	0.6188
Sept. 2	9 31.4	1.38	13 12.9	7.34	0.6136
12	9 45.1	1.35	11 58.0	7.60	0.6068
22	9 58.5	1.33	10 40.8	7.79	0.5983
Oct. 2	10 11.5	1.27	9 22.1	7.91	0.5882
12	10 24.0	1.23	8 2.5	7.95	0.5764
22	10 36.1	1.17	6 43.0	7.90	0.5629
Nov. 1	10 47.5	1.10	5 24.5	7.75	0.5477
11	10 58.2	1.02	4 8.0	7.49	0.5308
21	11 8.0	0.93	2 54.7	7.10	0.5122
Dec. 1	11 16.8	0.83	1 45.9	6.60	0.4920
11	11 24.5	0.70	+ 0 42.8	5.94	0.4703
21	11 30.8	0.64	- 0 13.0	5.13	0.4474
31	11 35.4	+0.57	- 0 59.8	-4.16	0.4236

WASHINGTON MEAN NOON.

⑪ PARTHENOPE.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "	
Jan. -5	21 18.6	+2.00	-17 30.9	+ 8.29	0.4550
+5	21 38.5	1.99	16 3.6	9.14	0.4671
15	21 58.4	1.98	14 28.6	9.88	0.4777
25	22 18.2	1.97	12 47.0	10.43	0.4869
Feb. 4	22 37.9	1.96	10 59.9	10.92	0.4948
14	22 57.4	1.94	9 8.5	11.29	0.5012
24	23 16.8	1.93	7 14.0	11.54	0.5064
Mar. 6	23 36.0	1.91	5 17.6	11.67	0.5102
16	23 55.1	1.90	3 20.5	11.80	0.5127
26	0 14.0	1.88	- 1 23.8	11.89	0.5139
April 5	0 32.7	1.87	+ 0 31.3	11.96	0.5199
15	0 51.4	1.86	2 23.8	11.97	0.5126
25	1 9.9	1.84	4 12.7	10.86	0.5100
May 5	1 28.3	1.83	5 57.1	10.17	0.5061
15	1 46.5	1.81	7 36.1	9.89	0.5009
25	2 4.6	1.80	9 8.9	8.93	0.4944
June 4	2 22.5	1.78	10 34.7	8.90	0.4865
14	2 40.2	1.76	11 53.0	7.43	0.4772
24	2 57.6	1.73	13 3.3	6.80	0.4665
July 4	3 14.6	1.67	14 5.0	6.73	0.4543
14	3 31.0	1.61	14 58.0	4.86	0.4406
24	3 46.8	1.54	15 42.1	3.99	0.4253
Aug. 3	4 1.9	1.48	16 17.3	3.06	0.4084
13	4 15.9	1.34	16 43.8	2.23	0.3899
23	4 28.7	1.20	17 1.9	1.42	0.3698
Sept. 2	4 40.0	1.04	17 12.2	0.66	0.3483
12	4 49.5	0.84	17 15.5	+ 0.01	0.3254
22	4 56.8	0.61	17 12.5	- 0.66	0.3015
Oct. 2	5 1.7	0.35	17 4.3	1.02	0.2772
12	5 3.8	+0.06	16 52.0	1.37	0.2533
22	5 2.8	-0.26	16 36.8	1.60	0.2309
Nov. 1	4 58.6	0.56	16 19.9	1.71	0.2115
11	4 51.6	0.61	16 2.5	1.68	0.1968
21	4 42.4	0.86	15 46.2	1.47	0.1886
Dec. 1	4 32.0	1.08	15 33.0	1.06	0.1880
11	4 21.7	0.96	15 25.1	- 0.42	0.1953
21	4 12.8	0.77	15 24.5	+ 0.37	0.2100
31	4 6.3	-0.50	+15 32.6	+ 1.28	0.2306

⑫ EGERIA.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "	
Jan. -5	0 15.8	+0.72	- 4 42.6	+11.24	0.3683
+5	0 23.8	0.87	2 48.1	11.63	0.4100
15	0 33.3	1.01	- 0 49.9	11.94	0.4301
25	0 44.1	1.13	+ 1 10.8	12.17	0.4485
Feb. 4	0 55.9	1.23	3 13.4	12.30	0.4652
14	1 8.7	1.32	5 16.8	12.33	0.4802
24	1 22.3	1.40	7 20.1	12.31	0.4934
Mar. 6	1 36.7	1.47	9 23.0	12.21	0.5048
16	1 51.8	1.54	11 24.3	12.02	0.5146
26	2 7.5	1.60	13 23.5	11.78	0.5227
April 5	2 23.8	1.66	15 19.9	11.48	0.5292
15	2 40.7	1.72	17 12.5	11.06	0.5341
25	2 58.3	1.77	19 0.9	10.56	0.5376
May 5	3 16.2	1.83	20 44.1	10.08	0.5395
15	3 34.8	1.88	22 21.6	9.43	0.5400
25	3 53.8	1.92	23 52.7	8.76	0.5390
June 4	4 13.2	1.97	25 16.9	8.03	0.5367
14	4 33.2	2.01	26 33.4	7.25	0.5330
24	4 53.5	2.04	27 42.0	6.45	0.5280
July 4	5 14.1	2.07	28 42.4	5.61	0.5216
14	5 35.0	2.09	29 34.3	4.79	0.5138
24	5 56.0	2.10	30 18.0	3.96	0.5047
Aug. 3	6 17.1	2.11	30 53.5	3.18	0.4942
13	6 38.2	2.10	31 21.6	2.45	0.4822
23	6 59.1	2.07	31 42.6	1.82	0.4688
Sept. 2	7 19.7	2.04	31 58.0	1.31	0.4540
12	7 39.9	1.99	32 8.8	0.84	0.4376
22	7 59.5	1.92	32 16.8	0.75	0.4198
Oct. 2	8 18.4	1.84	32 23.9	0.79	0.4004
12	8 36.4	1.75	32 32.6	1.04	0.3795
22	8 53.4	1.63	32 44.8	1.56	0.3573
Nov. 1	9 9.1	1.49	33 4.2	2.40	0.3337
11	9 23.2	1.31	33 32.9	3.43	0.3090
21	9 35.4	1.11	34 14.1	4.87	0.2836
Dec. 1	9 45.3	0.88	35 10.3	6.41	0.2579
11	9 52.5	0.54	36 22.4	7.96	0.2327
21	9 56.4	+0.21	37 49.3	9.34	0.2091
31	9 56.7	-0.17	+39 27.3	+10.20	0.1883

WASHINGTON MEAN NOON.

⑭ IRENE.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 12 22.3	+1.30	+ 8 12.5	- 3.14	0.2802
+5	12 34.6	1.14	7 48.1	- 1.61	0.2517
15	12 45.1	0.98	7 40.3	+ 0.11	0.2222
25	12 53.6	0.71	7 50.3	1.90	0.1923
Feb. 4	12 59.4	0.43	8 18.4	3.71	0.1628
14	13 2.3	+0.13	9 4.5	5.38	0.1351
24	13 2.1	-0.18	10 5.0	6.48	0.1105
Mar. 6	12 58.7	0.47	11 14.1	6.86	0.0910
16	12 52.6	0.71	12 22.3	6.23	0.0777
26	12 44.5	0.84	13 18.8	4.59	0.0739
April 5	12 35.8	0.88	13 54.1	+ 2.14	0.0783
15	12 27.9	0.69	14 1.6	- 0.69	0.0906
25	12 21.9	0.47	13 40.2	3.46	0.1096
May 5	12 18.5	-0.19	12 52.3	6.90	0.1335
15	12 18.0	+0.09	11 42.1	4.88	0.1606
25	12 20.3	0.38	10 14.7	9.40	0.1892
June 4	12 25.1	0.68	8 34.1	10.44	0.2183
14	12 32.1	0.79	6 43.8	11.36	0.2471
24	12 41.0	0.97	4 46.9	11.92	0.2751
July 4	12 51.5	1.11	2 45.4	12.20	0.3021
14	13 3.3	1.24	+ 0 41.1	12.49	0.3278
24	13 16.3	1.34	- 1 24.4	12.44	0.3520
Aug. 3	13 30.2	1.43	3 29.7	12.47	0.3748
13	13 45.0	1.53	5 33.8	12.30	0.3961
23	14 0.6	1.59	7 35.6	11.99	0.4160
Sept. 2	14 16.9	1.68	9 33.7	11.68	0.4344
12	14 33.8	1.73	11 27.5	11.16	0.4512
22	14 51.3	1.78	13 15.7	10.51	0.4668
Oct. 2	15 9.4	1.83	14 57.7	9.84	0.4808
12	15 28.0	1.88	16 32.5	9.09	0.4934
22	15 47.0	1.92	17 59.4	8.28	0.4956
Nov. 1	16 6.5	1.98	19 17.7	7.39	0.5143
11	16 26.2	1.99	20 26.6	6.40	0.5225
21	16 46.3	1.97	21 25.7	5.40	0.5293
Dec. 1	17 6.5	2.01	22 14.7	4.38	0.5345
11	17 26.8	2.03	22 53.4	3.36	0.5303
21	17 47.2	2.03	23 22.0	2.36	0.5406
31	18 7.3	+1.08	-23 40.6	- 1.36	0.5413

⑮ FORTUNA.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 15 29.1	+1.58	-18 43.2	-5.13	0.5436
+5	15 44.1	1.48	19 31.5	4.49	0.5309
15	15 58.8	1.44	20 13.0	3.82	0.5163
25	16 12.9	1.37	20 47.9	3.16	0.4998
Feb. 4	16 26.2	1.29	21 16.2	2.51	0.4814
14	16 38.7	1.19	21 38.1	1.89	0.4612
24	16 50.0	1.08	21 54.1	1.32	0.4392
Mar. 6	16 59.8	0.90	22 4.5	0.79	0.4156
16	17 8.0	0.71	22 10.0	-0.33	0.3906
26	17 14.1	0.51	22 11.0	+0.06	0.3646
April 5	17 18.3	+0.28	22 8.8	0.40	0.3379
15	17 19.8	0.00	22 3.0	0.73	0.3116
25	17 18.3	-0.27	21 54.2	1.05	0.2864
May 5	17 14.0	0.56	21 42.0	1.36	0.2636
15	17 7.3	0.77	21 26.9	1.68	0.2448
25	16 58.7	0.98	21 8.4	1.99	0.2315
June 4	16 48.7	1.00	20 47.0	2.17	0.2246
14	16 38.6	0.98	20 24.9	2.14	0.2248
24	16 29.5	0.81	20 4.2	1.85	0.2318
July 4	16 22.3	0.58	19 47.9	1.31	0.2447
14	16 17.6	0.32	19 38.0	+0.62	0.2621
24	16 15.8	-0.04	19 35.5	-0.13	0.2825
Aug. 3	16 16.7	+0.22	19 40.7	0.85	0.3046
13	16 20.3	0.48	19 52.6	1.45	0.3374
23	16 26.3	0.71	20 9.8	1.90	0.3499
Sept. 2	16 34.5	0.92	20 30.7	2.18	0.3718
12	16 44.8	1.11	20 53.3	2.26	0.3923
22	16 56.7	1.29	21 15.9	2.18	0.4118
Oct. 2	17 10.7	1.41	21 36.9	1.91	0.4296
12	17 24.9	1.50	21 54.2	1.49	0.4458
22	17 40.8	1.54	22 6.7	0.94	0.4604
Nov. 1	17 57.7	1.73	22 13.0	-0.26	0.4733
11	18 15.5	1.81	22 11.9	+0.48	0.4846
21	18 34.0	1.88	22 2.4	1.39	0.4943
Dec. 1	18 53.1	1.98	21 44.0	2.34	0.5023
11	19 12.6	1.97	21 15.5	3.34	0.5087
21	19 32.5	2.00	20 37.2	4.33	0.5136
31	19 52.6	+2.01	-19 48.8	+5.30	0.5169

WASHINGTON MEAN NOON.

⑮ EUNOMIA.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	14 26.4	+1.30	-25 10.8	-7.03	0.5596
+5	14 38.0	1.14	26 23.5	7.13	0.5455
15	14 49.2	1.06	27 34.4	6.91	0.5292
25	14 59.3	0.94	28 41.7	6.49	0.5112
Feb. 4	15 8.1	0.81	29 44.3	6.05	0.4918
14	15 15.5	0.66	30 42.8	5.60	0.4710
24	15 21.1	0.46	31 36.3	5.06	0.4492
Mar. 6	15 24.7	+0.34	32 24.0	4.39	0.4268
16	15 25.9	-0.01	33 4.1	3.55	0.4044
26	15 24.5	0.37	33 35.0	2.46	0.3828
April 5	15 20.5	0.52	33 53.4	-1.09	0.3629
15	15 14.1	0.74	33 56.8	+0.54	0.3459
25	15 5.7	0.90	33 42.5	2.36	0.3328
May 5	14 56.1	0.97	33 9.6	4.13	0.3248
15	14 46.3	0.94	32 19.8	5.60	0.3223
25	14 37.3	0.81	31 17.5	6.58	0.3255
June 4	14 30.0	0.62	30 8.2	6.92	0.3341
14	14 24.9	0.38	28 59.1	6.68	0.3470
24	14 22.3	-0.13	27 55.6	5.88	0.3633
July 4	14 22.3	+0.11	27 1.5	4.82	0.3819
14	14 24.5	0.33	26 19.2	3.64	0.4015
24	14 29.0	0.64	25 48.6	2.47	0.4217
Aug. 3	14 35.4	0.73	25 29.7	1.38	0.4416
13	14 43.6	0.90	25 21.0	+0.43	0.4608
23	14 53.4	1.03	25 21.1	-0.35	0.4788
Sept. 2	15 4.3	1.15	25 28.0	0.95	0.4957
12	15 16.5	1.27	25 40.1	1.39	0.5112
22	15 29.8	1.37	25 55.8	1.66	0.5253
Oct. 2	15 44.0	1.46	26 13.3	1.76	0.5377
12	15 59.1	1.54	26 31.1	1.72	0.5484
22	16 14.9	1.61	26 47.7	1.53	0.5575
Nov. 1	16 31.4	1.66	27 1.8	1.22	0.5649
11	16 48.5	1.73	27 12.3	0.80	0.5707
21	17 6.1	1.77	27 17.8	-0.27	0.5748
Dec. 1	17 24.0	1.80	27 17.7	+0.33	0.5771
11	17 42.2	1.83	27 11.2	1.02	0.5778
21	18 0.7	1.88	26 57.3	1.75	0.5768
31	18 19.2	+1.88	-26 36.2	+2.49	0.5741

⑯ THETIS.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	6 40.8	-1.03	+19 7.1	+2.44	0.2528
+5	6 30.3	1.02	19 32.8	2.60	0.2525
15	6 20.4	0.90	19 59.2	2.61	0.2594
25	6 12.3	0.69	20 25.1	2.38	0.2725
Feb. 4	6 6.6	0.42	20 49.8	2.40	0.2905
14	6 3.8	-0.13	21 13.2	2.26	0.3118
24	6 3.9	+0.16	21 35.0	2.06	0.3349
Mar. 6	6 6.8	0.42	21 54.8	1.84	0.3586
16	6 12.3	0.66	22 11.9	1.54	0.3820
26	6 20.0	0.86	22 25.7	1.16	0.4046
April 5	6 29.6	1.04	22 35.2	0.70	0.4269
15	6 40.8	1.18	22 39.7	+0.15	0.4457
25	6 53.3	1.30	22 38.3	-0.46	0.4638
May 5	7 6.9	1.41	22 30.4	1.14	0.4802
15	7 21.5	1.49	22 15.5	1.86	0.4948
25	7 36.8	1.66	21 53.4	2.26	0.5077
June 4	7 52.7	1.61	21 23.8	2.34	0.5189
14	8 9.0	1.63	20 46.6	4.10	0.5285
24	8 25.7	1.68	20 1.8	4.86	0.5364
July 4	8 42.6	1.70	19 9.6	5.32	0.5427
14	8 59.7	1.71	18 10.4	6.25	0.5475
24	9 16.9	1.72	17 4.5	6.90	0.5508
Aug. 3	9 34.1	1.72	15 52.4	7.49	0.5525
13	9 51.4	1.73	14 34.7	8.02	0.5527
23	10 8.7	1.72	13 11.9	8.80	0.5515
Sept. 2	10 25.9	1.71	11 44.7	8.30	0.5487
12	10 43.0	1.71	10 13.9	9.21	0.5444
22	11 0.1	1.70	8 40.5	9.43	0.5386
Oct. 2	11 17.1	1.69	7 5.3	9.67	0.5312
12	11 34.0	1.69	5 29.1	9.61	0.5222
22	11 50.9	1.68	3 53.0	9.35	0.5116
Nov. 1	12 7.6	1.60	2 18.0	9.39	0.4994
11	12 24.1	1.64	+ 0 45.2	9.11	0.4855
21	12 40.4	1.62	- 0 44.2	8.66	0.4696
Dec. 1	12 56.5	1.59	2 9.1	8.20	0.4522
11	13 12.3	1.55	3 26.3	7.67	0.4330
21	13 27.6	1.50	4 40.6	6.81	0.4119
31	13 42.3	+1.43	- 5 44.6	-6.96	0.3889

WASHINGTON MEAN NOON.

⑮ MELPOMENE.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	16 16.1	+1.70	-13 26.9	-3.36	0.5353
+5	16 33.0	1.68	13 56.4	2.48	0.5234
15	16 49.8	1.67	14 16.5	1.87	0.5100
25	17 6.4	1.64	14 27.8	-0.67	0.4947
Feb. 4	17 22.6	1.63	14 30.0	+0.23	0.4774
14	17 38.3	1.64	14 23.4	1.03	0.4582
24	17 53.4	1.46	14 8.3	1.90	0.4372
Mar. 6	18 7.6	1.37	13 45.3	2.63	0.4140
16	18 20.3	1.27	13 15.3	3.30	0.3890
26	18 33.0	1.14	12 39.2	3.86	0.3622
April 5	18 43.7	0.98	11 58.3	4.24	0.3335
15	18 52.7	0.80	11 14.4	4.48	0.3032
25	18 59.7	0.68	10 29.7	4.40	0.2717
May 5	19 4.4	0.34	9 46.3	4.11	0.2392
15	19 6.6	+0.07	9 7.5	3.47	0.2067
25	19 5.9	-0.22	8 36.8	2.49	0.1750
June 4	19 2.2	0.51	8 17.6	+1.14	0.1450
14	18 55.7	0.78	8 14.0	-0.53	0.1209
24	18 46.9	0.94	8 23.3	2.38	0.1018
July 4	18 36.8	1.02	9 1.6	4.21	0.0903
14	18 26.5	0.96	9 52.6	5.79	0.0872
24	18 17.5	0.77	10 57.5	7.09	0.0923
Aug. 3	18 11.1	0.48	12 14.5	7.00	0.1046
13	18 7.8	-0.15	13 29.6	7.66	0.1222
23	18 8.0	+0.20	14 47.6	7.12	0.1433
Sept. 2	18 11.8	0.54	16 2.0	7.12	0.1665
12	18 18.9	0.86	17 10.0	6.87	0.1903
22	18 29.0	1.14	18 9.4	5.42	0.2140
Oct. 2	18 41.7	1.39	18 58.4	4.29	0.2369
12	18 56.8	1.60	19 35.3	3.02	0.2587
22	19 13.8	1.79	19 58.9	1.69	0.2792
Nov. 1	19 32.6	1.94	20 8.0	-0.14	0.2983
11	19 52.7	2.06	20 1.8	+1.39	0.3159
21	20 13.9	2.16	19 40.1	2.97	0.3321
Dec. 1	20 36.0	2.24	19 2.4	4.84	0.3469
11	20 58.8	2.30	18 9.3	6.06	0.3604
21	21 22.0	2.34	17 1.1	7.48	0.3727
31	21 45.6	+2.37	-15 38.7	+8.87	0.3838

⑯ MASSILIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	17 50.0	+1.80	-23 1.6	-0.30	0.5702
+5	18 8.0	1.79	23 0.2	+0.47	0.5677
15	18 25.8	1.77	22 52.1	1.17	0.5634
25	18 43.4	1.73	22 36.7	1.88	0.5575
Feb. 4	19 0.5	1.69	22 14.5	2.54	0.5498
14	19 17.2	1.63	21 45.9	3.13	0.5404
24	19 33.2	1.87	21 11.9	3.62	0.5291
Mar. 6	19 48.6	1.60	20 33.4	4.02	0.5161
16	20 3.2	1.41	19 51.5	4.30	0.5012
26	20 16.9	1.32	19 7.4	4.45	0.4846
April 5	20 29.6	1.21	18 22.4	4.47	0.4663
15	20 41.1	1.08	17 37.9	4.34	0.4462
25	20 51.3	0.96	16 55.5	4.04	0.4245
May 5	21 0.3	0.79	16 17.0	3.67	0.4013
15	21 7.1	0.69	15 44.0	2.98	0.3769
25	21 12.2	0.40	15 18.3	2.12	0.3516
June 4	21 15.1	+0.17	15 1.7	+1.12	0.3260
14	21 15.7	-0.07	14 55.8	0.00	0.3009
24	21 13.8	0.32	15 1.8	-1.18	0.2772
July 4	21 9.3	0.66	15 19.5	2.27	0.2563
14	21 2.5	0.77	15 47.3	3.14	0.2397
24	20 53.8	0.92	16 22.4	3.69	0.2228
Aug. 3	20 44.1	0.96	17 1.1	3.81	0.2046
13	20 34.5	0.90	17 38.7	3.51	0.2276
23	20 26.0	0.72	18 11.3	2.89	0.2371
Sept. 2	20 19.7	0.51	18 36.6	2.09	0.2523
12	20 15.8	-0.26	18 53.1	1.20	0.2717
22	20 14.4	+0.01	19 0.6	-0.30	0.2938
Oct. 2	20 16.0	0.29	18 59.1	+0.00	0.3173
12	20 20.3	0.54	18 48.6	1.48	0.3412
22	20 26.8	0.78	18 29.4	2.24	0.3646
Nov. 1	20 35.4	0.94	18 1.8	3.17	0.3871
11	20 45.6	1.09	17 25.9	4.01	0.4083
21	20 57.3	1.22	16 41.6	4.83	0.4280
Dec. 1	21 10.2	1.34	15 48.8	5.69	0.4459
11	21 24.1	1.42	14 47.7	6.50	0.4622
21	21 38.7	1.49	13 38.7	7.27	0.4766
31	21 53.9	+1.84	-12 22.2	+7.98	0.4893

WASHINGTON MEAN NOON.

②① LUTETIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	"	
Jan. -5	16 2.6	+1.98	-19 30.2	- 5.84	0.5089
+5	16 22.0	1.94	20 24.7	5.00	0.4911
15	16 41.4	1.94	21 10.3	4.11	0.4766
25	17 0.8	1.93	21 47.0	3.23	0.4605
Feb. 4	17 20.0	1.90	22 14.9	2.36	0.4427
14	17 38.9	1.86	22 34.3	1.54	0.4231
24	17 57.3	1.81	22 45.7	0.77	0.4017
Mar. 6	18 15.2	1.75	22 49.7	- 0.09	0.3785
16	18 32.3	1.68	22 47.6	+ 0.45	0.3535
26	18 48.3	1.54	22 40.7	0.84	0.3267
April 5	19 3.2	1.41	22 30.7	1.06	0.2983
15	19 16.6	1.25	22 19.6	1.06	0.2683
25	19 28.3	1.06	22 9.7	0.80	0.2368
May 5	19 37.9	0.83	22 3.6	+ 0.29	0.2043
15	19 45.0	0.67	22 3.8	- 0.45	0.1712
25	19 49.3	+0.37	22 12.5	1.38	0.1385
June 4	19 50.5	-0.04	22 31.4	2.41	0.1073
14	19 48.4	0.37	23 0.7	3.35	0.0793
24	19 43.1	0.66	23 38.4	3.99	0.0565
July 4	19 35.1	0.88	24 20.6	4.16	0.0408
14	19 25.6	0.96	25 1.6	3.77	0.0340
24	19 16.1	0.87	25 36.1	3.96	0.0365
Aug. 3	19 8.9	0.66	26 0.9	1.94	0.0477
13	19 3.1	-0.33	26 15.0	0.98	0.0661
23	19 1.5	+0.03	26 19.5	- 0.02	0.0898
Sept. 2	19 3.7	0.39	26 15.5	+ 0.79	0.1168
12	19 9.4	0.72	26 3.6	1.68	0.1454
22	19 18.2	1.02	25 43.8	2.39	0.1746
Oct. 2	19 29.8	1.27	25 15.8	3.24	0.2034
12	19 43.6	1.46	24 38.9	4.16	0.2314
22	19 59.1	1.62	23 52.5	5.14	0.2582
Nov. 1	20 16.1	1.75	22 56.0	6.17	0.2837
11	20 34.2	1.84	21 49.1	7.21	0.3078
21	20 53.0	1.91	20 31.8	8.23	0.3304
Dec. 1	21 12.4	1.96	19 4.4	9.21	0.3515
11	21 32.1	1.98	17 27.6	10.11	0.3712
21	21 52.0	2.00	15 42.2	10.33	0.3895
31	22 12.1	+2.01	-13 48.9	+11.67	0.4064

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Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	"	
Jan. -5	12 34.3	+0.77	+12 17.1	-0.41	0.4418
+5	12 41.1	0.59	12 19.6	+0.25	0.4215
15	12 46.1	0.39	12 36.1	2.34	0.4008
25	12 48.9	+0.16	13 6.4	3.08	0.3805
Feb. 4	12 49.4	-0.07	13 49.4	4.79	0.3614
14	12 47.5	0.20	14 42.3	5.67	0.3445
24	12 43.3	0.52	15 40.9	5.88	0.3311
Mar. 6	12 37.0	0.71	16 39.0	5.43	0.3222
16	12 29.2	0.82	17 29.5	4.39	0.3185
26	12 20.7	0.84	18 6.8	3.89	0.3205
April 5	12 12.3	0.79	18 25.9	+0.89	0.3222
15	12 4.9	0.66	18 24.6	-1.14	0.3409
25	11 59.1	0.48	18 3.1	2.02	0.3576
May 5	11 55.3	0.27	17 24.2	4.64	0.3779
15	11 53.6	-0.06	16 30.3	5.99	0.3961
25	11 54.0	+0.13	15 24.3	7.07	0.4200
June 4	11 56.3	0.32	14 8.8	7.98	0.4421
14	12 0.4	0.48	12 45.6	8.58	0.4638
24	12 5.9	0.62	11 18.2	9.26	0.4843
July 4	12 12.8	0.74	9 45.9	9.36	0.5039
14	12 20.8	0.84	8 10.6	9.64	0.5221
24	12 29.7	0.93	6 33.1	9.61	0.5389
Aug. 3	12 39.4	1.01	4 54.3	9.22	0.5542
13	12 49.9	1.07	3 14.7	9.26	0.5680
23	13 0.9	1.12	+ 1 35.0	9.26	0.5801
Sept. 2	13 12.5	1.18	- 0 4.4	9.26	0.5906
12	13 24.5	1.22	1 42.7	9.75	0.5996
22	13 36.9	1.25	3 19.4	9.87	0.6072
Oct. 2	13 49.6	1.29	4 54.2	9.34	0.6129
12	14 2.6	1.31	6 26.3	9.05	0.6171
22	14 15.9	1.34	7 55.3	8.72	0.6196
Nov. 1	14 29.4	1.35	9 20.8	8.24	0.6203
11	14 43.0	1.36	10 42.2	7.91	0.6191
21	14 56.7	1.37	11 59.0	7.44	0.6168
Dec. 1	15 10.4	1.36	13 11.0	6.28	0.6125
11	15 24.0	1.25	14 17.7	6.40	0.6064
21	15 37.4	1.23	15 19.0	5.85	0.5986
31	15 50.6	+1.20	-16 14.8	-5.29	0.5890

WASHINGTON MEAN NOON.

(29) THALIA.

(20) PROSERPINA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	^h ^m ^m		[°] [']	[']			^h ^m ^m		[°] [']	[']	
Jan. -5	17 20.9	+1.07	-24 22.4	-2.03	0.5909	Jan. -5	21 43.9	+1.00	-16 34.6	+3.40	0.5111
+5	17 37.4	1.04	24 49.3	2.43	0.5882	+5	21 59.0	1.02	15 7.8	8.80	0.5252
15	17 53.7	1.00	25 10.9	1.88	0.5838	15	22 14.4	1.04	13 36.8	9.29	0.5373
25	18 9.4	1.05	25 26.9	1.36	0.5776	25	22 29.9	1.05	12 2.0	9.64	0.5476
Feb. 4	18 24.7	1.49	25 38.0	0.01	0.5697	Feb. 4	22 45.5	1.06	10 24.0	9.92	0.5563
14	18 39.3	1.42	25 45.2	0.00	0.5597	14	23 1.1	1.05	8 43.6	10.12	0.5633
24	18 53.2	1.34	25 49.9	0.29	0.5482	24	23 16.6	1.04	7 1.5	10.26	0.5686
Mar. 6	19 6.2	1.34	25 53.1	0.81	0.5360	Mar. 6	23 32.0	1.04	5 18.3	10.32	0.5722
16	19 18.1	1.13	25 56.1	0.37	0.5201	16	23 47.4	1.03	3 35.0	10.31	0.5743
26	19 23.9	1.00	26 0.5	0.08	0.5036	26	0 2.6	1.01	1 52.1	10.28	0.5748
April 5	19 38.2	0.86	26 7.8	0.04	0.4868	April 5	0 17.7	1.00	-0 10.4	10.07	0.5737
15	19 46.0	0.80	26 19.4	1.46	0.4663	15	0 32.6	1.08	+1 20.4	9.88	0.5710
25	19 52.0	0.80	26 37.0	3.12	0.4470	25	0 47.3	1.06	3 6.7	9.57	0.5667
May 5	19 56.0	0.29	27 1.8	2.86	0.4267	May 5	1 1.8	1.44	4 40.9	9.22	0.5609
15	19 57.8	+0.06	27 34.3	2.08	0.4067	15	1 16.1	1.41	6 11.2	8.61	0.5535
25	19 57.2	-0.19	28 14.5	4.38	0.3877	25	1 30.0	1.37	7 37.3	8.36	0.5446
June 4	19 54.0	0.44	29 1.0	4.85	0.3706	June 4	1 43.6	1.34	8 58.5	7.88	0.5340
14	19 48.4	0.07	29 51.5	5.06	0.3566	14	1 56.8	1.29	10 14.4	7.30	0.5218
24	19 40.6	0.85	30 42.1	4.88	0.3468	24	2 9.4	1.22	11 24.6	6.71	0.5081
July 4	19 31.4	0.97	31 28.2	4.21	0.3430	July 4	2 21.3	1.15	12 28.6	6.07	0.4926
14	19 21.2	1.00	32 6.4	3.24	0.3428	14	2 32.5	1.06	13 26.0	5.40	0.4757
24	19 11.3	0.03	32 33.0	2.06	0.3491	24	2 42.6	0.98	14 16.6	4.70	0.4571
Aug. 3	19 2.6	0.77	32 47.6	-0.01	0.3604	Aug. 3	2 51.6	0.92	15 0.1	3.98	0.4371
13	18 55.8	0.56	32 51.3	+0.07	0.3759	13	2 59.1	0.87	15 36.2	3.22	0.4159
23	18 51.3	0.31	32 46.1	0.81	0.3946	23	3 4.9	0.48	16 4.5	2.45	0.3937
Sept. 2	18 49.5	-0.06	32 35.1	1.35	0.4150	Sept. 2	3 8.7	0.36	16 24.6	1.50	0.3710
12	18 50.1	+0.18	32 19.1	1.78	0.4366	12	3 10.3	+0.03	16 36.4	+0.73	0.3485
22	18 53.2	0.43	31 59.5	2.08	0.4583	22	3 9.4	-0.22	16 39.2	-0.18	0.3269
Oct. 2	18 58.7	0.61	31 37.4	2.34	0.4796	Oct. 2	3 5.9	0.46	16 32.7	1.00	0.3076
12	19 5.5	0.78	31 12.6	2.60	0.5001	12	3 0.1	0.08	16 17.3	1.95	0.2918
22	19 14.2	0.94	30 45.4	2.87	0.5193	22	2 52.3	0.84	15 53.7	2.66	0.2810
Nov. 1	19 24.4	1.07	30 15.1	2.19	0.5371	Nov. 1	2 43.2	0.92	15 24.0	3.08	0.2763
11	19 35.6	1.17	29 41.6	3.08	0.5533	11	2 33.8	0.90	14 52.1	3.10	0.2784
21	19 47.8	1.26	29 4.4	3.92	0.5679	21	2 25.2	0.78	14 21.9	2.72	0.2870
Dec. 1	20 0.8	1.32	28 23.1	4.31	0.5806	Dec. 1	2 18.1	0.50	13 57.7	1.91	0.3015
11	20 14.3	1.37	27 38.2	4.71	0.5918	11	2 13.4	0.35	13 43.6	-0.85	0.3202
21	20 28.3	1.41	26 48.9	5.12	0.6011	21	2 11.0	-0.11	13 40.6	+0.29	0.3421
31	20 42.6	+1.44	-25 55.5	+4.55	0.6086	31	2 11.2	+0.09	+13 49.4	+1.35	0.3656

WASHINGTON MEAN NOON.

②⑦ EUTERPE.

②⑨ AMPHITRITE.

Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'			h m	m	° '	'	
Jan. -5	15 53.6	+1.87	-19 22.9	-6.13	0.5290	Jan. -5	16 42.3	+1.82	-26 36.0	-4.08	0.5588
+5	16 10.3	1.83	20 10.3	4.35	0.5196	+5	17 0.5	1.81	27 13.1	3.34	0.5515
15	16 26.3	1.87	20 49.9	3.80	0.5085	15	17 18.6	1.79	27 42.9	2.64	0.5425
25	16 41.7	1.81	21 22.4	2.91	0.4954	25	17 36.4	1.76	28 6.0	1.99	0.5318
Feb. 4	16 56.5	1.43	21 48.2	2.25	0.4806	Feb. 4	17 53.8	1.71	28 22.8	1.39	0.5194
14	17 10.4	1.33	22 7.5	1.64	0.4639	14	18 10.7	1.65	28 33.9	0.87	0.5052
24	17 23.2	1.31	22 21.1	1.13	0.4455	24	18 26.9	1.67	28 40.2	0.44	0.4893
Mar. 6	17 34.6	1.08	22 30.0	0.71	0.4254	Mar. 6	18 42.2	1.48	28 42.8	-0.13	0.4717
16	17 44.4	0.89	22 35.3	0.40	0.4037	16	18 56.5	1.37	28 42.9	+0.04	0.4524
26	17 52.4	0.80	22 38.1	0.21	0.3808	26	19 9.6	1.34	28 42.0	+0.08	0.4314
April 5	17 58.3	0.46	22 39.5	0.13	0.3569	April 5	19 21.3	1.08	28 41.7	-0.08	0.4089
15	18 1.8	+0.21	22 40.5	0.11	0.3327	15	19 31.2	0.89	28 43.6	0.38	0.3852
25	18 2.6	-0.07	22 41.8	0.16	0.3089	25	19 39.2	0.70	28 49.3	0.82	0.3603
May 5	18 0.4	0.36	22 43.8	0.21	0.2866	May 5	19 45.2	0.46	29 0.1	1.37	0.3349
15	17 55.4	0.62	22 46.1	0.20	0.2672	15	19 48.5	+0.19	29 16.8	2.00	0.3096
25	17 47.9	0.85	22 47.9	-0.10	0.2519	25	19 49.0	-0.09	29 40.1	2.37	0.2851
June 4	17 38.4	1.00	22 48.2	+0.08	0.2423	June 4	19 46.6	0.39	30 8.3	2.93	0.2626
14	17 27.8	1.03	22 46.2	0.30	0.2393	14	19 41.2	0.66	30 38.7	2.94	0.2435
24	17 17.3	0.99	22 42.1	0.44	0.2432	24	19 33.3	0.89	31 7.2	2.32	0.2292
July 4	17 7.9	0.83	22 37.3	0.45	0.2538	July 4	19 23.4	1.03	31 29.1	1.66	0.2209
14	17 0.6	0.80	22 33.0	0.32	0.2696	14	19 12.7	1.05	31 40.2	-0.47	0.2195
24	16 55.8	0.33	22 30.9	+0.01	0.2896	24	19 2.4	0.94	31 38.6	+0.78	0.2249
Aug. 3	16 53.9	-0.05	22 32.7	-0.37	0.3122	Aug. 3	18 53.8	0.73	31 24.9	1.68	0.2366
13	16 54.7	+0.21	22 38.3	0.72	0.3364	13	18 47.7	0.46	31 1.4	2.08	0.2533
23	16 58.1	0.46	22 47.2	1.03	0.3606	23	18 44.6	-0.15	30 31.3	2.21	0.2737
Sept. 2	17 3.9	0.68	22 58.9	1.22	0.3845	Sept. 2	18 44.6	+0.14	29 57.1	2.53	0.2964
12	17 11.7	0.87	23 11.7	1.27	0.4075	12	18 47.5	0.43	29 20.6	2.73	0.3202
22	17 21.4	1.04	23 24.4	1.20	0.4293	22	18 53.2	0.68	28 42.4	2.91	0.3442
Oct. 2	17 32.6	1.19	23 35.8	1.00	0.4495	Oct. 2	19 1.1	0.89	28 2.3	4.14	0.3677
12	17 45.3	1.33	23 44.4	0.68	0.4682	12	19 11.1	1.08	27 19.6	4.43	0.3902
22	17 59.0	1.43	23 49.1	-0.23	0.4851	22	19 22.8	1.23	26 33.7	4.79	0.4115
Nov. 1	18 13.8	1.32	23 48.8	+0.32	0.5002	Nov. 1	19 35.8	1.38	25 43.7	5.28	0.4314
11	18 29.4	1.59	23 42.6	0.94	0.5135	11	19 50.0	1.46	24 48.6	5.79	0.4497
21	18 45.7	1.66	23 29.9	1.63	0.5251	21	20 5.1	1.54	23 47.9	6.88	0.4663
Dec. 1	19 2.6	1.71	23 10.0	2.38	0.5348	Dec. 1	20 20.9	1.60	22 41.0	7.01	0.4813
11	19 19.9	1.74	22 42.6	3.13	0.5427	11	20 37.2	1.65	21 27.7	7.08	0.4945
21	19 37.4	1.76	22 7.4	3.90	0.5489	21	20 53.9	1.69	20 7.8	8.32	0.5061
31	19 55.1	+1.77	-21 24.5	+4.66	0.5534	31	21 11.0	+1.73	-18 41.2	+8.88	0.5160

WASHINGTON MEAN NOON.

♅ URANIA.

♁ POMONA.

Data.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.	Data.	Right Ascen- sion.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	^h ^m	^m	[°] [']	[']			^h ^m	^m	[°] [']	[']	
Jan. -5	0 53.7	+1.08	+ 8 36.6	+5.46	0.2155	Jan. -5	1 1.9	+0.52	+ 7 2.0	+1.60	0.3797
+5	1 5.5	1.26	9 37.4	6.54	0.2454	+5	1 8.1	0.70	7 24.8	2.86	0.4035
15	1 18.9	1.42	10 47.5	7.35	0.2737	15	1 16.0	0.87	7 59.2	3.91	0.4263
25	1 33.9	1.58	12 4.5	7.91	0.3003	25	1 25.4	1.00	8 43.0	4.78	0.4476
Feb. 4	1 50.1	1.67	13 25.8	8.24	0.3252	Feb. 4	1 36.1	1.12	9 34.2	5.40	0.4672
14	2 7.3	1.77	14 49.4	8.36	0.3484	14	1 47.9	1.22	10 30.9	5.86	0.4852
24	2 25.5	1.86	16 13.1	8.27	0.3698	24	2 0.6	1.31	11 31.5	6.17	0.5013
Mar. 6	2 44.5	1.93	17 34.8	7.97	0.3896	Mar. 6	2 14.2	1.39	12 34.4	6.31	0.5156
16	3 4.2	2.00	18 52.5	7.49	0.4077	16	2 28.5	1.46	13 37.7	6.30	0.5282
26	3 24.6	2.06	20 4.7	6.87	0.4242	26	2 43.5	1.53	14 40.5	6.21	0.5390
April 5	3 45.5	2.12	21 9.9	6.09	0.4393	April 5	2 59.1	1.58	15 42.0	5.97	0.5477
15	4 7.0	2.16	22 6.6	5.19	0.4529	15	3 15.2	1.63	16 40.0	5.57	0.5554
25	4 28.8	2.19	22 53.8	4.20	0.4651	25	3 31.7	1.67	17 33.5	5.12	0.5612
May 5	4 50.9	2.22	23 30.7	3.12	0.4759	May 5	3 48.6	1.71	18 22.5	4.61	0.5653
15	5 13.2	2.28	23 56.5	2.00	0.4854	15	4 5.9	1.74	19 5.8	4.01	0.5679
25	5 35.6	2.24	24 10.8	+0.85	0.4937	25	4 23.4	1.76	19 42.7	3.33	0.5690
June 4	5 58.0	2.22	24 13.5	-0.23	0.5006	June 4	4 41.2	1.78	20 12.5	2.60	0.5685
14	6 20.3	2.22	24 4.2	1.51	0.5063	14	4 59.1	1.79	20 34.8	1.82	0.5665
24	6 42.5	2.20	23 43.2	2.64	0.5107	24	5 17.1	1.79	20 49.0	+1.01	0.5630
July 4	7 4.3	2.16	23 11.3	3.71	0.5139	July 4	5 35.0	1.79	20 55.1	-0.18	0.5580
14	7 25.8	2.12	22 28.9	4.73	0.5158	14	5 52.9	1.78	20 52.7	0.64	0.5515
24	7 46.8	2.07	21 36.6	5.67	0.5164	24	6 10.7	1.76	20 42.3	1.48	0.5433
Aug. 3	8 7.3	2.03	20 35.4	6.52	0.5157	Aug. 3	6 28.2	1.73	20 23.1	2.29	0.5338
13	8 27.4	1.97	19 26.2	7.27	0.5137	13	6 45.3	1.69	19 56.5	3.04	0.5226
23	8 46.8	1.91	18 10.0	7.90	0.5103	23	7 2.0	1.64	19 22.2	3.78	0.5098
Sept. 2	9 5.7	1.85	16 48.2	8.43	0.5055	Sept. 2	7 18.1	1.58	18 41.2	4.40	0.4953
12	9 23.9	1.78	15 21.4	8.96	0.4991	12	7 33.6	1.51	17 54.1	4.98	0.4790
22	9 41.4	1.72	13 51.0	9.16	0.4912	22	7 48.3	1.42	17 1.5	5.44	0.4610
Oct. 2	9 58.3	1.65	12 18.3	9.32	0.4818	Oct. 2	8 2.0	1.31	16 5.2	5.78	0.4413
12	10 14.4	1.57	10 44.6	9.37	0.4706	12	8 14.6	1.19	15 5.8	6.02	0.4198
22	10 29.7	1.49	9 10.9	9.28	0.4578	22	8 25.9	1.06	14 4.7	6.05	0.3965
Nov. 1	10 44.2	1.40	7 38.9	9.06	0.4432	Nov. 1	8 35.8	0.90	13 4.7	5.90	0.3716
11	10 57.7	1.30	6 9.8	8.68	0.4267	11	8 43.9	0.71	12 6.6	5.59	0.3453
21	11 10.2	1.18	4 45.2	8.16	0.4084	21	8 50.0	0.49	11 12.9	5.02	0.3179
Dec. 1	11 21.4	1.04	3 26.5	7.48	0.3884	Dec. 1	8 53.7	+0.24	10 26.1	4.20	0.2900
11	11 31.1	0.89	2 15.5	6.62	0.3667	11	8 54.9	-0.02	9 48.9	3.12	0.2625
21	11 39.2	0.71	1 14.1	5.56	0.3434	21	8 53.3	0.33	9 23.7	1.81	0.2365
31	11 45.3	+0.53	+ 0 24.3	-4.22	0.3191	31	8 48.3	-0.70	+ 9 12.7	-0.84	0.2136

WASHINGTON MEAN NOON.

②③ POLYHYMNIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 19 23.9	m +2.47	° -23 21.0	' + 5.12	0.4755
+5	19 48.7	2.48	22 22.0	6.63	0.4753
15	20 13.5	2.48	21 8.3	8.08	0.4742
25	20 38.3	2.47	19 40.4	9.46	0.4723
Feb. 4	21 3.0	2.48	17 59.2	10.73	0.4696
14	21 27.4	2.43	16 6.0	11.86	0.4663
24	21 51.6	2.40	14 2.0	12.86	0.4623
Mar. 6	22 15.4	2.36	11 48.7	13.66	0.4577
16	22 38.9	2.33	9 28.7	14.26	0.4526
26	23 2.0	2.29	7 3.5	14.73	0.4469
April 5	23 24.8	2.27	4 34.0	15.00	0.4408
15	23 47.3	2.24	-2 3.5	15.03	0.4341
25	0 9.6	2.21	+ 0 26.6	14.89	0.4270
May 5	0 31.6	2.18	2 54.4	14.69	0.4193
15	0 53.3	2.15	5 18.5	14.12	0.4109
25	1 14.7	2.12	7 36.9	13.49	0.4020
June 4	1 35.8	2.09	9 48.4	12.74	0.3924
14	1 56.5	2.06	11 51.8	11.88	0.3819
24	2 16.8	2.00	13 46.0	10.92	0.3705
July 4	2 36.5	1.94	15 30.2	9.89	0.3582
14	2 55.6	1.86	17 3.9	8.82	0.3448
24	3 13.8	1.77	18 26.9	7.77	0.3302
Aug. 3	3 31.0	1.66	19 39.3	6.73	0.3144
13	3 46.8	1.49	20 41.4	5.68	0.2973
23	4 0.9	1.32	21 33.9	4.80	0.2790
Sept. 2	4 13.2	1.10	22 17.4	3.94	0.2596
12	4 23.0	0.84	22 52.7	3.16	0.2394
22	4 30.0	0.64	23 20.7	2.45	0.2189
Oct. 2	4 33.8	+0.21	23 41.7	1.76	0.1989
12	4 34.2	-0.13	23 56.0	1.03	0.1804
22	4 31.1	0.48	24 2.7	+ 0.23	0.1651
Nov. 1	4 24.6	0.77	24 0.7	- 0.66	0.1546
11	4 15.6	0.97	23 49.5	1.64	0.1508
21	4 5.2	1.04	23 29.8	2.27	0.1548
Dec. 1	3 54.8	0.96	23 4.1	2.62	0.1671
11	3 45.9	0.76	22 37.1	2.53	0.1868
21	3 39.5	0.60	22 13.4	2.03	0.2125
31	3 35.9	-0.24	+21 56.5	- 1.32	0.2423

②④ CIRCE.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	h m 10 15.7	m +0.22	° + 4 34.4	' - 2.12	0.2471
+5	10 16.6	-0.04	4 21.5	- 0.32	0.2202
15	10 14.8	0.31	4 28.0	+ 1.43	0.1956
25	10 10.4	0.55	4 54.6	3.61	0.1752
Feb. 4	10 3.7	0.73	5 40.2	5.28	0.1607
14	9 55.7	0.81	6 40.3	6.40	0.1536
24	9 47.5	0.77	7 48.3	6.79	0.1548
Mar. 6	9 40.2	0.63	8 56.2	6.43	0.1640
16	9 34.9	0.40	9 57.0	5.48	0.1800
26	9 32.1	-0.13	10 45.8	4.12	0.2012
April 5	9 32.2	+0.14	11 19.7	2.63	0.2256
15	9 35.0	0.41	11 37.8	+ 1.03	0.2522
25	9 40.4	0.64	11 40.4	- 0.45	0.2792
May 5	9 47.9	0.84	11 28.7	1.88	0.3060
15	9 57.3	1.01	11 3.3	3.14	0.3319
25	10 8.2	1.16	10 25.9	4.29	0.3566
June 4	10 20.3	1.26	9 37.4	5.34	0.3799
14	10 33.5	1.35	8 39.1	6.26	0.4017
24	10 47.4	1.42	7 32.2	7.07	0.4220
July 4	11 1.9	1.48	6 17.7	7.77	0.4406
14	11 17.0	1.33	4 56.8	8.36	0.4578
24	11 32.5	1.26	3 30.5	8.84	0.4732
Aug. 3	11 48.3	1.00	2 0.0	9.21	0.4875
13	12 4.5	1.63	+ 0 26.3	9.47	0.5001
23	12 20.9	1.65	- 1 9.5	9.64	0.5113
Sept. 2	12 37.6	1.68	2 46.5	9.71	0.5210
12	12 54.5	1.70	4 23.7	9.67	0.5293
22	13 11.6	1.72	6 0.0	9.54	0.5363
Oct. 2	13 28.9	1.74	7 34.5	9.31	0.5418
12	13 46.4	1.76	9 6.2	8.97	0.5458
22	14 4.1	1.78	10 34.0	8.54	0.5485
Nov. 1	14 21.9	1.78	11 57.1	7.93	0.5497
11	14 39.8	1.79	13 14.6	7.43	0.5494
21	14 57.8	1.80	14 25.8	6.76	0.5476
Dec. 1	15 15.8	1.79	15 29.9	6.06	0.5443
11	15 33.7	1.78	16 26.1	5.20	0.5395
21	15 51.5	1.77	17 14.0	4.36	0.5330
31	16 9.1	+1.75	-17 53.3	- 3.64	0.5250

WASHINGTON MEAN NOON.

⑤7 FIDES.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	18 39.5	+1.70	-25 29.0	+1.07	0.5992
+5	18 56.7	1.71	25 9.1	2.30	0.5984
15	19 13.7	1.00	24 43.0	2.02	0.5957
25	19 30.5	1.07	24 10.7	2.30	0.5914
Feb. 4	19 47.1	1.04	23 33.0	4.02	0.5853
14	20 3.4	1.01	22 50.3	4.49	0.5774
24	20 19.4	1.07	22 3.1	4.00	0.5678
Mar. 6	20 34.9	1.01	21 12.2	3.24	0.5567
16	20 49.8	1.46	20 18.2	3.48	0.5438
26	21 4.1	1.40	19 22.6	3.01	0.5289
April 5	21 17.8	1.33	18 26.1	3.04	0.5190
15	21 30.7	1.24	17 29.9	3.33	0.4933
25	21 42.7	1.16	16 35.5	3.97	0.4730
May 5	21 53.7	1.04	15 44.6	4.00	0.4511
15	22 3.6	0.92	14 57.6	4.40	0.4276
25	22 12.1	0.77	14 16.5	3.09	0.4025
June 4	22 19.1	0.61	13 43.9	2.78	0.3762
14	22 24.4	0.42	13 20.8	1.81	0.3494
24	22 27.6	+0.21	13 7.8	+0.08	0.3224
July 4	22 28.6	-0.01	13 7.6	-0.01	0.2954
14	22 27.3	0.26	13 20.0	1.06	0.2699
24	22 23.5	0.30	13 44.7	2.06	0.2474
Aug. 3	22 17.3	0.71	14 19.2	2.70	0.2292
13	22 9.3	0.86	14 59.9	4.06	0.2162
23	22 0.3	0.90	15 40.4	3.81	0.2100
Sept. 2	21 51.2	0.86	16 16.1	3.09	0.2113
12	21 43.2	0.71	16 42.2	1.06	0.2194
22	21 37.1	0.48	16 55.3	-0.03	0.2331
Oct. 2	21 33.6	-0.22	16 54.7	+0.72	0.2512
12	21 32.8	+0.06	16 41.0	2.06	0.2722
22	21 34.9	0.34	16 13.7	3.21	0.2949
Nov. 1	21 39.6	0.66	15 34.9	4.43	0.3179
11	21 46.6	0.80	14 45.2	3.47	0.3406
21	21 55.5	0.06	13 45.4	6.47	0.3623
Dec. 1	22 6.2	1.13	12 35.8	7.40	0.3829
11	22 18.2	1.26	11 17.4	3.22	0.4020
21	22 31.5	1.37	9 51.4	3.97	0.4196
31	22 45.6	+1.46	- 8 17.9	+3.07	0.4355

⑤8 LEDA.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	21 26.5	+1.36	-11 14.6	+ 6.46	0.5505
+5	21 40.3	1.39	10 6.4	7.16	0.5598
15	21 54.3	1.41	8 51.3	7.02	0.5674
25	22 8.5	1.43	7 30.0	8.40	0.5737
Feb. 4	22 22.9	1.44	6 3.2	8.01	0.5787
14	22 37.4	1.46	4 31.8	9.34	0.5820
24	22 52.1	1.47	2 56.3	9.71	0.5838
Mar. 6	23 6.9	1.48	- 1 17.5	10.01	0.5838
16	23 21.8	1.49	+ 0 23.9	10.26	0.5819
26	23 36.7	1.49	2 7.5	10.42	0.5782
April 5	23 51.5	1.49	3 52.3	10.22	0.5730
15	0 6.3	1.48	5 37.9	10.07	0.5665
25	0 21.1	1.47	7 23.8	10.06	0.5583
May 5	0 35.8	1.46	9 9.2	10.48	0.5488
15	0 50.3	1.44	10 53.4	10.32	0.5373
25	1 4.7	1.43	12 35.9	10.14	0.5246
June 4	1 19.0	1.43	14 16.3	9.89	0.5100
14	1 33.1	1.39	15 53.7	9.87	0.4939
24	1 46.9	1.33	17 27.7	9.20	0.4762
July 4	2 0.2	1.30	18 57.8	8.79	0.4568
14	2 12.9	1.28	20 23.6	8.34	0.4357
24	2 24.8	1.14	21 44.8	7.06	0.4131
Aug. 3	2 35.7	1.08	23 0.8	7.81	0.3888
13	2 45.5	0.89	24 11.1	6.70	0.3632
23	2 53.6	0.72	25 14.9	6.01	0.3363
Sept. 2	2 59.9	0.51	26 11.4	5.22	0.3084
12	3 3.9	+0.26	26 59.4	4.27	0.2802
22	3 5.1	-0.02	27 36.8	3.08	0.2525
Oct. 2	3 3.5	0.30	28 1.1	+ 1.61	0.2263
12	2 59.0	0.56	28 9.1	- 0.16	0.2032
22	2 51.8	0.81	27 58.0	2.11	0.1848
Nov. 1	2 42.8	0.92	27 26.8	4.03	0.1727
11	2 33.3	0.91	26 37.4	3.04	0.1682
21	2 24.6	0.77	25 35.5	6.40	0.1715
Dec. 1	2 17.8	0.55	24 29.4	8.41	0.1821
11	2 13.6	-0.28	23 27.3	3.04	0.1989
21	2 12.8	+0.06	22 36.2	4.36	0.2199
31	2 15.2	+0.40	+21 59.1	- 2.00	0.2421

WASHINGTON MEAN NOON.

④3 ISIS.

④0 VERGINIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declina- tion.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'			h m	m	° '	'	
Jan. -5	11 21.3	+0.24	14 7.9	+ 1.34	0.3978	Jan. -5	10 42.4	+0.24	6 18.0	- 0.24	0.3909
+5	11 23.5	+0.13	14 32.3	2.26	0.3733	+5	10 41.5	-0.20	6 23.0	+ 1.23	0.3722
15	11 23.7	-0.11	15 15.0	5.01	0.3500	15	10 38.4	0.42	6 42.5	2.08	0.3558
25	11 21.2	0.28	16 12.6	6.29	0.3289	25	10 33.1	0.63	7 16.6	2.28	0.3421
Feb. 4	11 16.1	0.61	17 20.9	7.10	0.3110	Feb. 4	10 25.9	0.78	8 2.1	4.04	0.3332
14	11 9.0	0.79	18 34.7	7.28	0.2980	14	10 17.5	0.85	8 55.5	5.47	0.3229
24	11 0.3	0.90	19 47.5	6.78	0.2909	24	10 8.8	0.85	9 51.5	5.47	0.3329
Mar. 6	10 50.9	0.94	20 50.4	5.00	0.2901	Mar. 6	10 0.4	0.77	10 45.0	5.00	0.3419
16	10 41.5	0.97	21 37.6	2.76	0.2958	16	9 53.3	0.61	11 31.5	4.15	0.3563
26	10 33.5	0.70	22 5.6	+ 1.29	0.3070	26	9 48.1	0.41	12 8.0	2.47	0.3746
April 5	10 27.4	0.49	22 13.4	- 0.19	0.3227	April 5	9 45.0	-0.20	12 32.9	1.00	0.3969
15	10 23.7	-0.25	22 2.6	1.00	0.3413	15	9 44.0	+0.01	12 46.1	+ 0.75	0.4190
25	10 22.4	0.00	21 35.5	2.28	0.3616	25	9 45.2	0.21	12 48.0	- 0.23	0.4426
May 5	10 23.7	+0.23	20 54.9	4.04	0.3826	May 5	9 48.2	0.22	12 39.4	1.24	0.4651
15	10 27.1	0.44	20 2.7	6.00	0.4036	15	9 52.9	0.64	12 21.1	2.25	0.4868
25	10 32.5	0.62	19 1.2	6.46	0.4239	25	9 59.0	0.67	11 54.3	2.47	0.5105
June 4	10 39.6	0.78	17 51.7	7.21	0.4420	June 4	10 6.4	0.79	11 19.6	2.22	0.5308
14	10 48.2	0.91	16 34.9	8.00	0.4606	14	10 14.8	0.87	10 37.9	4.45	0.5495
24	10 57.9	1.02	15 11.6	8.28	0.4769	24	10 23.9	0.96	9 49.9	5.47	0.5666
July 4	11 8.6	1.11	13 43.6	9.02	0.4916	July 4	10 33.8	1.01	8 56.5	5.20	0.5890
14	11 20.1	1.18	12 11.1	9.45	0.5046	14	10 44.2	1.06	7 58.1	6.24	0.5967
24	11 32.3	1.26	10 34.5	9.84	0.5160	24	10 55.1	1.10	6 55.6	6.43	0.6077
Aug. 3	11 45.3	1.23	8 54.3	10.16	0.5267	Aug. 3	11 6.3	1.13	5 49.4	6.76	0.6179
13	11 58.8	1.27	7 11.3	10.40	0.5339	13	11 17.8	1.16	4 40.3	7.03	0.6264
23	12 12.8	1.23	5 26.2	10.00	0.5404	23	11 29.5	1.17	3 28.8	7.24	0.6331
Sept. 2	12 27.3	1.25	3 39.3	10.70	0.5452	Sept. 2	11 41.3	1.19	2 15.5	7.40	0.6383
12	12 42.3	1.22	1 51.2	10.22	0.5486	12	11 53.3	1.20	+ 1 0.7	7.49	0.6416
22	12 57.7	1.25	+ 0 2.9	10.00	0.5503	22	12 5.3	1.20	- 0 14.3	7.00	0.6432
Oct. 2	13 13.4	1.20	- 1 44.9	10.44	0.5504	Oct. 2	12 17.4	1.20	1 29.3	7.47	0.6431
12	13 29.5	1.23	3 31.8	10.41	0.5489	12	12 29.4	1.19	2 43.7	7.26	0.6411
22	13 46.0	1.27	5 17.2	10.41	0.5459	22	12 41.3	1.18	3 56.6	7.19	0.6375
Nov. 1	14 2.9	1.20	7 0.1	10.11	0.5413	Nov. 1	12 53.1	1.17	5 7.6	6.26	0.6319
11	14 20.1	1.24	8 39.4	9.71	0.5350	11	13 4.7	1.14	6 15.8	6.45	0.6246
21	14 37.7	1.28	10 14.3	9.24	0.5271	21	13 16.0	1.11	7 20.6	6.26	0.6155
Dec. 1	14 55.7	1.31	11 44.2	8.71	0.5176	Dec. 1	13 26.9	1.04	8 21.4	5.20	0.6045
11	15 14.0	1.34	13 8.6	8.11	0.5065	11	13 37.3	1.01	9 17.3	5.22	0.5916
21	15 32.6	1.27	14 26.4	7.29	0.4937	21	13 47.1	0.92	10 7.8	4.72	0.5769
31	15 51.4	+1.09	-15 36.5	- 6.65	0.4792	31	13 56.0	+0.82	-10 51.8	- 4.47	0.5606

WASHINGTON MEAN NOON.

⑦ AGLAIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° '	'	
Jan. -5	6 8.6	-1.00	+30 43.7	0.00	0.3388
+5	5 58.8	0.01	30 39.6	-0.79	0.3400
15	5 50.3	0.74	30 27.8	1.43	0.3518
25	5 44.0	0.50	30 10.9	1.01	0.3681
Feb. 4	5 40.2	-0.25	29 51.5	1.06	0.3876
14	5 39.0	+0.01	29 31.8	1.01	0.4093
24	5 40.5	0.27	29 13.2	1.79	0.4318
Mar. 6	5 44.3	0.40	28 55.9	1.64	0.4584
16	5 50.2	0.68	28 40.3	1.54	0.4766
26	5 57.9	0.85	28 25.1	1.63	0.4977
April 5	6 7.2	0.99	28 9.8	1.58	0.5175
15	6 17.7	1.10	27 53.4	1.76	0.5358
25	6 29.2	1.20	27 34.6	1.97	0.5535
May 5	6 41.7	1.26	27 14.0	2.25	0.5677
15	6 54.8	1.34	26 49.6	2.63	0.5811
25	7 8.5	1.38	26 21.4	3.03	0.5929
June 4	7 22.5	1.43	25 49.0	3.45	0.6030
14	7 36.8	1.44	25 12.4	3.88	0.6114
24	7 51.3	1.46	24 31.3	4.25	0.6182
July 4	8 5.9	1.48	23 45.7	4.77	0.6234
14	8 20.4	1.48	22 55.9	5.26	0.6270
24	8 34.9	1.44	22 2.1	5.55	0.6289
Aug. 3	8 49.3	1.43	21 4.9	5.90	0.6293
13	9 3.5	1.41	20 4.1	6.21	0.6280
23	9 17.5	1.38	19 0.7	6.44	0.6251
Sept. 2	9 31.2	1.35	17 55.2	6.63	0.6206
12	9 44.5	1.31	16 48.2	6.73	0.6144
22	9 57.4	1.26	15 40.5	6.76	0.6065
Oct. 2	10 9.8	1.21	14 32.9	6.71	0.5970
12	10 21.7	1.16	13 26.3	6.56	0.5856
22	10 33.0	1.09	12 21.6	6.33	0.5726
Nov. 1	10 43.6	1.01	11 19.9	5.95	0.5578
11	10 53.3	0.92	10 22.5	5.47	0.5513
21	11 2.0	0.81	9 30.4	4.86	0.5231
Dec. 1	11 9.6	0.68	8 45.3	4.13	0.5035
11	11 15.7	0.54	8 8.0	3.25	0.4825
21	11 20.4	0.38	7 40.3	-2.23	0.4606
31	11 23.3	+0.20	+ 7 23.3		0.4362

30 HELIOCENTRIC COÖRDINATES.

M A R S.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{y^2}{r^2}y$.	$-\frac{z^2}{r^2}z$.
0	+1.3310	-0.3767	-0.0412	0.1411	344 11.2	-0.88	+0.25	+0.03
10	1.3673	0.2285	0.0388	0.1420	350 30.0	0.91	0.15	0.03
20	1.3886	-0.0779	0.0361	0.1434	356 46.5	0.91	+0.05	0.02
30	1.3947	+0.0737	0.0329	0.1452	3 00.5	0.90	-0.05	0.02
40	1.3858	0.2243	0.0294	0.1474	9 11.0	0.88	0.14	0.02
50	1.3620	0.3726	0.0255	0.1496	15 17.4	0.86	0.23	0.02
60	1.3238	0.5171	0.0214	0.1527	21 19.4	0.81	0.32	0.01
70	1.2721	0.6563	0.0171	0.1558	27 16.6	0.77	0.40	0.01
80	1.2076	0.7888	0.0126	0.1591	33 8.5	0.71	0.46	+0.01
90	1.1311	0.9135	0.0080	0.1625	38 54.9	0.65	0.53	0.00
100	1.0438	1.0295	-0.0033	0.1662	44 35.7	0.59	0.58	0.00
110	0.9469	1.1358	+0.0014	0.1699	50 10.9	0.52	0.62	0.00
120	0.8411	1.2317	0.0062	0.1736	55 40.4	0.45	0.65	-0.01
130	0.7278	1.3166	0.0109	0.1774	61 4.1	0.38	0.68	0.01
140	0.6083	1.3901	0.0154	0.1811	66 22.4	0.31	0.70	0.01
150	0.4836	1.4519	0.0199	0.1848	71 35.2	0.24	0.71	0.01
160	0.3550	1.5018	0.0241	0.1885	76 42.8	0.17	0.72	0.01
170	0.2234	1.5396	0.0282	0.1920	81 45.3	0.10	0.72	0.01
180	+0.0901	1.5653	0.0321	0.1954	86 43.1	-0.04	0.71	0.02
190	-0.0439	1.5790	0.0357	0.1986	91 36.4	+0.02	0.70	0.02
200	0.1776	1.5809	0.0391	0.2017	96 25.5	0.08	0.69	0.02
210	0.3100	1.5711	0.0421	0.2046	101 10.7	0.13	0.67	0.02
220	0.4402	1.5499	0.0448	0.2073	105 52.1	0.19	0.65	0.02
230	0.5672	1.5178	0.0473	0.2098	110 30.3	0.24	0.63	0.02
240	0.6903	1.4753	0.0494	0.2121	115 5.4	0.28	0.60	0.02
250	0.8087	1.4226	0.0512	0.2141	119 37.7	0.32	0.57	0.02
260	0.9217	1.3603	0.0526	0.2159	124 7.6	0.37	0.54	0.02
270	1.0285	1.2890	0.0537	0.2175	128 35.5	0.40	0.51	0.02
280	1.1286	1.2093	0.0544	0.2188	133 1.5	0.44	0.47	0.02
290	1.2212	1.1217	0.0548	0.2199	137 26.0	0.47	0.43	0.02
300	1.3061	1.0268	0.0548	0.2207	141 49.5	0.50	0.39	0.02
310	1.3826	0.9253	0.0545	0.2213	146 12.2	0.53	0.35	0.02
320	1.4501	0.8178	0.0538	0.2216	150 34.3	0.55	0.31	0.02
330	1.5083	0.7050	0.0528	0.2216	154 56.2	0.58	0.27	0.02
340	1.5570	0.5877	0.0514	0.2214	159 18.2	0.60	0.23	0.02
350	1.5956	0.4668	0.0497	0.2209	163 40.6	0.61	0.18	0.02
360	1.6239	0.3429	0.0477	0.2202	168 3.8	0.63	0.13	0.02
370	1.6417	0.2167	0.0454	0.2192	172 27.9	0.64	0.08	0.02
380	-1.6490	+0.0891	+0.0428	0.2180	176 53.6	+0.64	-0.03	-0.02

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Helioptic and Equinox of this date all the coördinates are referred.

HELIOCENTRIC COÖRDINATES. 31

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
390	-1.6454	-0.0392	+0.0398	0.2165	181 20.9	+0.65	+0.02	-0.02
400	1.6310	0.1671	0.0367	0.2148	185 50.1	0.65	0.07	0.01
410	1.6054	0.2938	0.0333	0.2128	190 21.6	0.65	0.12	0.01
420	1.5688	0.4186	0.0296	0.2106	194 55.7	0.65	0.17	0.01
430	1.5215	0.5406	0.0258	0.2081	199 32.8	0.64	0.23	0.01
440	1.4636	0.6587	0.0218	0.2055	204 13.2	0.62	0.28	0.01
450	1.3951	0.7721	0.0176	0.2026	208 57.1	0.61	0.34	0.01
460	1.3166	0.8799	0.0133	0.1996	213 44.8	0.59	0.39	-0.01
470	1.2282	0.9811	0.0089	0.1964	218 36.8	0.56	0.45	0.00
480	1.1305	1.0749	+0.0044	0.1931	223 33.1	0.53	0.50	0.00
490	1.0240	1.1602	-0.0001	0.1896	228 34.2	0.49	0.55	0.00
500	0.9092	1.2363	0.0046	0.1860	233 40.2	0.44	0.60	0.00
510	0.7870	1.3023	0.0091	0.1823	238 51.4	0.39	0.65	+0.01
520	0.6583	1.3573	0.0135	0.1786	244 8.0	0.33	0.68	0.01
530	0.5238	1.4007	0.0177	0.1748	249 30.1	0.27	0.72	0.01
540	0.3848	1.4317	0.0219	0.1710	254 57.9	0.21	0.77	0.01
550	0.2423	1.4497	0.0258	0.1673	260 31.3	0.13	0.81	0.02
560	-0.0976	1.4541	0.0294	0.1637	266 10.5	+0.05	0.83	0.02
570	+0.0482	1.4447	0.0328	0.1602	271 55.4	-0.04	0.85	0.02
580	0.1935	1.4212	0.0359	0.1568	277 45.7	0.12	0.85	0.02
590	0.3368	1.3834	0.0387	0.1536	283 41.4	0.21	0.84	0.02
600	0.4765	1.3317	0.0410	0.1507	289 42.0	0.30	0.83	0.03
610	0.6113	1.2658	0.0430	0.1481	295 47.3	0.39	0.80	0.03
620	0.7397	1.1866	0.0443	0.1458	301 56.8	0.48	0.77	0.03
630	0.8600	1.0945	0.0453	0.1439	308 9.9	0.55	0.71	0.03
640	0.9710	0.9905	0.0458	0.1423	314 25.9	0.64	0.65	0.03
650	1.0712	0.8755	0.0457	0.1412	320 44.3	0.71	0.58	0.03
660	1.1594	0.7508	0.0451	0.1405	327 4.3	0.77	0.50	0.03
670	1.2347	0.6177	0.0441	0.1403	333 25.0	0.83	0.41	0.03
680	1.2961	0.4777	0.0426	0.1406	339 45.8	0.87	0.32	0.03
690	1.3430	0.3323	0.0405	0.1412	346 5.7	0.89	0.22	0.03
700	1.3751	0.1831	0.0380	0.1423	352 24.1	0.90	0.12	0.03
710	1.3920	-0.0320	0.0351	0.1439	358 40.1	0.91	+0.02	0.02
720	1.3934	+0.1195	0.0318	0.1458	4 53.3	0.90	-0.07	0.02
730	1.3798	0.2697	0.0282	0.1481	11 2.7	0.88	0.17	0.02
740	1.3517	0.4171	0.0243	0.1507	17 8.0	0.84	0.26	0.02
750	1.3095	0.5602	0.0201	0.1536	23 8.7	0.80	0.34	0.01
760	1.2538	0.6973	0.0158	0.1568	29 4.3	0.75	0.42	0.01
770	+1.1858	+0.8273	-0.0112	0.1602	34 54.7	-0.70	-0.48	+0.01

NOTE.—The Epoch is the 2460,000th day of the Julian Period = 1858, November 16; to the Mean Ecliptic and Equinox of this date all the coördinates are referred.

32 HELIOCENTRIC COÖRDINATES.

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{y^2}{r^2}y$.	$-\frac{z^2}{r^2}z$.
0	+1.34902	+4.89465	-0.04793	0.70564	74 35 3	-46.56	-168.95	+1.66
10	1.27530	4.91770	0.04634	0.70591	75 27 17	43.94	169.43	1.60
20	1.20129	4.93965	0.04474	0.70619	76 19 28	41.31	169.86	1.54
30	1.12702	4.96049	0.04314	0.70647	77 11 35	38.69	170.25	1.48
40	1.05248	4.98021	0.04153	0.70675	78 3 37	36.06	170.59	1.43
50	0.97770	4.99881	0.03990	0.70704	78 55 35	33.43	170.88	1.37
60	0.90270	5.01630	0.03826	0.70732	79 47 29	30.81	171.14	1.31
70	0.82751	5.03266	0.03662	0.70761	80 39 19	28.19	171.37	1.26
80	0.75214	5.04791	0.03498	0.70789	81 31 5	25.57	171.56	1.20
90	0.67661	5.06203	0.03332	0.70818	82 22 48	22.96	171.70	1.14
100	0.60092	5.07503	0.03166	0.70847	83 14 26	20.35	171.79	1.08
110	0.52510	5.08690	0.02999	0.70876	84 6 1	17.75	171.85	1.02
120	0.44915	5.09764	0.02831	0.70905	84 57 31	15.15	171.87	0.96
130	0.37310	5.10725	0.02662	0.70935	85 48 57	12.56	171.84	0.90
140	0.29698	5.11573	0.02493	0.70964	86 40 19	9.98	171.77	0.84
150	0.22080	5.12308	0.02324	0.70994	87 31 37	7.41	171.67	0.78
160	0.14457	5.12930	0.02154	0.71023	88 22 51	4.84	171.53	0.72
170	+0.06830	5.13441	0.01984	0.71053	89 13 59	- 2.28	171.35	0.66
180	-0.00799	5.13840	0.01812	0.71082	90 5 4	+ 0.26	171.13	0.61
190	0.08427	5.14126	0.01640	0.71112	90 56 4	2.79	170.88	0.55
200	0.16053	5.14301	0.01468	0.71142	91 47 0	5.32	170.58	0.49
210	0.23676	5.14364	0.01296	0.71172	92 37 52	7.83	170.25	0.43
220	0.31294	5.14315	0.01123	0.71203	93 28 39	10.33	169.88	0.38
230	0.38905	5.14154	0.00950	0.71233	94 19 23	12.82	169.47	0.32
240	0.46508	5.13882	0.00777	0.71263	95 10 2	15.29	169.02	0.26
250	0.54101	5.13500	0.00603	0.71293	96 0 37	17.75	168.54	0.20
260	0.61681	5.13007	0.00430	0.71324	96 51 7	20.19	168.02	0.15
270	0.69248	5.12404	0.00257	0.71354	97 41 34	22.62	167.48	0.09
280	0.76801	5.11692	-0.00083	0.71384	98 31 57	25.04	166.90	+0.03
290	0.84337	5.10870	+0.00090	0.71414	99 22 15	27.44	166.29	-0.02
300	0.91855	5.09939	0.00263	0.71445	100 12 30	29.83	165.63	0.08
310	0.99354	5.08899	0.00436	0.71475	101 2 41	32.19	164.95	0.13
320	1.06832	5.07751	0.00609	0.71505	101 52 47	34.54	164.24	0.19
330	1.14287	5.06496	0.00782	0.71535	102 42 49	36.87	163.49	0.25
340	1.21718	5.05133	0.00955	0.71566	103 32 47	39.19	162.70	0.30
350	1.29123	5.03664	0.01127	0.71596	104 22 40	41.49	161.89	0.36
360	1.36601	5.02089	0.01299	0.71626	105 12 29	43.77	161.05	0.41
370	1.43951	5.00408	0.01472	0.71656	106 2 13	46.03	160.18	0.47
380	-1.51170	+4.98622	+0.01644	0.71686	106 51 54	+48.28	-159.28	-0.52

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.

HELIOCENTRIC COÖRDINATES. 33

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbt.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
390	-1.58457	+4.96732	+0.01815	0.71716	107 41 30	+ 50.50	-158.35	-0.56
400	1.65711	4.94738	0.01986	0.71746	108 31 2	52.72	157.38	0.60
410	1.72931	4.92641	0.02157	0.71776	109 20 30	54.90	156.39	0.66
420	1.80115	4.90442	0.02327	0.71807	110 9 54	57.07	155.37	0.72
430	1.87261	4.88141	0.02497	0.71837	110 59 14	59.21	154.32	0.78
440	1.94369	4.85739	0.02667	0.71866	111 48 30	61.32	153.24	0.83
450	2.01437	4.83237	0.02836	0.71896	112 37 43	63.42	152.14	0.88
460	2.08463	4.80635	0.03004	0.71926	113 26 51	65.50	151.01	0.94
470	2.15447	4.77934	0.03172	0.71955	114 15 55	67.56	149.86	0.99
480	2.22386	4.75134	0.03339	0.71984	115 4 56	69.60	148.68	1.04
490	2.29280	4.72237	0.03505	0.72014	115 53 53	71.61	147.48	1.09
500	2.36127	4.69243	0.03670	0.72043	116 42 46	73.60	146.25	1.14
510	2.42926	4.66154	0.03835	0.72072	117 31 35	75.57	144.99	1.19
520	2.49675	4.62969	0.03999	0.72101	118 20 20	77.52	143.71	1.24
530	2.56373	4.59691	0.04162	0.72129	119 9 0	79.44	142.41	1.29
540	2.63019	4.56319	0.04324	0.72158	119 57 37	81.34	141.08	1.33
550	2.69612	4.52855	0.04485	0.72186	120 46 10	83.22	139.73	1.38
560	2.76150	4.49299	0.04646	0.72214	121 34 39	85.07	138.37	1.42
570	2.82632	4.45652	0.04806	0.72242	122 23 4	86.90	136.99	1.47
580	2.89058	4.41916	0.04964	0.72270	123 11 25	88.70	135.58	1.51
590	2.95426	4.38090	0.05122	0.72298	123 59 43	90.48	134.15	1.56
600	3.01735	4.34177	0.05278	0.72326	124 47 57	92.24	132.70	1.60
610	3.07983	4.30176	0.05434	0.72353	125 36 8	93.97	131.23	1.65
620	3.14169	4.26090	0.05588	0.72380	126 24 15	95.68	129.74	1.69
630	3.20293	4.21918	0.05741	0.72407	127 12 19	97.36	128.23	1.74
640	3.26353	4.17663	0.05894	0.72434	128 0 19	99.02	126.71	1.78
650	3.32348	4.13324	0.06045	0.72461	128 48 16	100.65	125.17	1.82
660	3.38277	4.08904	0.06195	0.72487	129 36 10	102.26	123.60	1.87
670	3.44139	4.04402	0.06343	0.72514	130 24 0	103.84	122.01	1.91
680	3.49933	3.99821	0.06490	0.72540	131 11 46	105.40	120.41	1.95
690	3.55658	3.95161	0.06636	0.72566	131 59 28	106.93	118.79	1.99
700	3.61314	3.90423	0.06780	0.72592	132 47 8	108.44	117.15	2.03
710	3.66898	3.85609	0.06924	0.72617	133 34 44	109.92	115.50	2.07
720	3.72411	3.80719	0.07067	0.72642	134 22 17	111.38	113.83	2.11
730	3.77850	3.75754	0.07208	0.72667	135 9 46	112.82	112.15	2.15
740	3.83216	3.70716	0.07348	0.72691	135 57 11	114.23	110.46	2.19
750	3.88507	3.65605	0.07486	0.72716	136 44 33	115.60	108.75	2.23
760	3.93721	3.60423	0.07622	0.72740	137 31 52	116.95	107.02	2.27
770	-3.98859	+3.55170	+0.07757	0.72764	138 19 10	+118.28	-105.28	-2.30

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.

34 HELIOCENTRIC COÖRDINATES.

SATURN								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
0	-5.37566	+7.34932	+0.09391	0.95933	126 11 40	+ 9.63	-13.16	-0.17
20	5.47156	7.28280	0.09887	0.95950	126 55 43	9.79	13.02	0.18
40	5.56661	7.21513	0.10381	0.95968	127 39 46	9.94	12.88	0.18
60	5.66080	7.14631	0.10874	0.95986	128 23 46	10.10	12.74	0.19
80	5.75411	7.07636	0.11365	0.96005	129 7 44	10.25	12.60	0.20
100	5.84651	7.00530	0.11855	0.96024	129 51 39	10.40	12.45	0.21
120	5.93800	6.93314	0.12342	0.96044	130 35 33	10.55	12.31	0.22
140	6.02856	6.85990	0.12827	0.96063	131 19 25	10.70	12.16	0.23
160	6.11818	6.78559	0.13310	0.96083	132 3 15	10.84	12.02	0.24
180	6.20684	6.71024	0.13792	0.96103	132 47 1	10.98	11.87	0.24
200	6.29454	6.63385	0.14271	0.96123	133 30 44	11.12	11.71	0.25
220	6.38127	6.55642	0.14747	0.96144	134 14 25	11.26	11.56	0.26
240	6.46701	6.47796	0.15221	0.96165	134 58 4	11.40	11.41	0.27
260	6.55175	6.39849	0.15694	0.96186	135 41 39	11.53	11.26	0.28
280	6.63547	6.31802	0.16164	0.96207	136 25 14	11.66	11.10	0.28
300	6.71817	6.23658	0.16631	0.96229	137 8 46	11.79	10.94	0.29
320	6.79982	6.15419	0.17095	0.96250	137 52 16	11.91	10.78	0.30
340	6.88141	6.07085	0.17556	0.96272	138 35 43	12.03	10.62	0.31
360	6.95995	5.98658	0.18015	0.96295	139 19 7	12.15	10.45	0.31
380	7.03842	5.90138	0.18471	0.96317	140 2 28	12.27	10.29	0.32
400	7.11581	5.81527	0.18925	0.96340	140 45 45	12.39	10.12	0.33
420	7.19212	5.72827	0.19375	0.96363	141 28 59	12.51	9.96	0.34
440	7.26733	5.64039	0.19823	0.96386	142 12 25	12.62	9.79	0.35
460	7.34142	5.55165	0.20268	0.96409	142 55 37	12.73	9.62	0.35
480	7.41439	5.46207	0.20711	0.96433	143 38 44	12.83	9.45	0.36
500	7.48622	5.37165	0.21150	0.96456	144 21 49	12.93	9.28	0.36
520	7.55690	5.28041	0.21585	0.96480	145 4 51	13.03	9.10	0.37
540	7.62642	5.18836	0.22016	0.96504	145 47 49	13.13	8.93	0.37
560	7.69479	5.09552	0.22444	0.96528	146 30 45	13.22	8.76	0.38
580	7.76200	5.00191	0.22869	0.96553	147 13 37	13.32	8.58	0.39
600	7.82804	4.90755	0.23290	0.96577	147 56 27	13.41	8.41	0.40
620	7.89290	4.81245	0.23708	0.96602	148 39 15	13.50	8.23	0.41
640	7.95657	4.71663	0.24122	0.96627	149 21 59	13.58	8.05	0.41
660	8.01904	4.62011	0.24533	0.96652	150 4 40	13.66	7.87	0.42
680	8.08029	4.52290	0.24941	0.96677	150 47 18	13.74	7.69	0.42
700	8.14032	4.42501	0.25344	0.96702	151 29 53	13.82	7.51	0.43
720	8.19914	4.32645	0.25744	0.96728	152 12 26	13.90	7.33	0.44
740	8.25674	4.22723	0.26140	0.96753	152 54 56	13.97	7.15	0.44
760	-8.31312	+4.12737	+0.26532	0.96779	153 37 22	+14.04	- 6.97	-0.45

Note. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.

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